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Bibliography on General Oceanographic Meteorology

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- B. Bibliographic references to other items of interest to the profession.
- C. Selective, annotated bibliographies on subjects of immediate and special interest to meteorologists.

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METEOROLOGICAL ABSTRACTS AND BIBLIOGRAPHY

MALCOLM RIGBY, Editor

Vol. 5

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No. 1



SPECIAL FEATURE IN THIS ISSUE

A Selective Annotated Bibliography on General
Oceanographic Meteorology

(For complete table of contents see back cover)

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FOREWORD

Meteorological Abstracts and Bibliography is a monthly publication whose purpose is to bring to the attention of meteorologists current literature in their field and in related fields and to provide bibliographic information on various subjects, as interest demands.

Part I contains abstracts of current literature in the fields of meteorology, oceanography, etc., arranged according to the Universal Decimal Classification.

Part II of each issue comprises a special annotated bibliography of important references on a special subject. No attempt is made to prepare exhaustive bibliographies; instead, the aim is to include a representative cross section of the various aspects of a subject.

Bibliographies published in the successive issues of Vol. 1, 1950 were:

1) Atmospheric Pollution, 2) Aerobiology, 3) Cloud Physics, 4) Hail, 5) Tornadoes, 6) Volcanic Dust, 7) Climatic Changes, 8) Thunderstorms, 9) Icing, 10) Acoustical Propagation and 11) Evaporation.

Those published in Vol. II, 1951 were:

1) Extended Forecasting, 2) Long Range Forecasting, 3) Soil Temperature, 4) Constants, Tables, etc., 5) Climate of Near East, 6) Climate of Middle East, 7) Special Winds, 8) Radar Storm Detection, 9) Condensation Trails, 10) Climate of Northeast Africa and 11) Mountain Meteorology.

Other bibliographies previously published were:

No.	Mo.	Vol. III, 1952	Vol. IV, 1953
1.	Jan.	Climate—Northwest Africa	Turbulence Theory
2.	Feb.	Carbon Dioxide	Turbulent Diffusion and Exchange
3.	March	Climate—Argentina, etc.	Frost and Frost Forecasting
4.	April	Dew	Climate of Australia and New Zealand
5.	May	Objective Forecasting	High Level Winds (500–100 mb)
6.	June	Stratus Forecasting	High Level Winds (above 100 mb)
7.	July	Urban Climatology	Jet Stream
8.	Aug.	Climate—Central Africa	Radiation Bioclimatology
9.	Sept.	Visibility	Climatology of the Pacific
10.	Oct.	Glaze and Rime	Auroras
11.	Nov.	Free Air Turbulence	Sferics

Forthcoming bibliographies will be:

1. General Oceanographic Meteorology, Vol. V, No. 1, Jan. 1954
2. Climate of Southeast Asia and Netherlands Indies, Vol. V, No. 2, Feb. 1954
3. Physics of Auroras, Vol. 5, No. 3, March 1954

Other bibliographies in preparation are:

<i>Actinometers</i>	<i>Ozone</i>
<i>Arctic Meteorology</i>	<i>Radiation Data</i>
<i>Balloons</i>	<i>Snow Cover</i>
<i>Climate of the Arctic</i>	<i>Synoptic Aerology</i>
<i>Engineering Meteorology</i>	<i>Tropical Cyclones</i>
<i>Machine Methods in Meteorology</i>	<i>Tropopause Variations</i>
<i>Microwave Propagation</i>	<i>Wind Waves and Currents</i>

Part III contains a listing of the contents of those journals which are primarily meteorological. These are published in the earliest issue where space permits.

Part IV is made up of author, subject and geographical indexes. In the December issue cumulative author, subject, geographical and journal indexes are published.

EXPLANATIONS

Location of material: For each entry, a symbol is given for at least one library where the material may be found. The Union List of Serials (Gregory) is the source of most of the symbols used. In some cases, where no symbol has been assigned to a library, one will be devised according to the principles of the Union List.

Library symbols used frequently may be found in the following list:

DA:	U. S. Dept. of Agriculture Library, Washington, D. C.
DBS:	U. S. Bureau of Standards Library, Washington, D. C.
DGS:	U. S. Geological Survey Library, Washington, D. C.
DLC:	Library of Congress, Washington, D. C.
DN-HO:	U. S. Navy Hydrographic Office Library, Suitland, Md.
DSG:	U. S. Army Medical Library, Washington, D. C.
DSI:	Smithsonian Institution Library, Washington, D. C.
DWB:	U. S. Weather Bureau Library, Washington, D. C.
GB-MO:	Great Britain, Meteorological Office Library, Harrow, England.
MH-BH:	Harvard University, Blue Hill Observatory (and American Meteorological Society) Library, Milton, Mass.
MWB:	Marine Biological Laboratory (depository for Woods Hole Oceanographic Institution), Woods Hole, Mass.
NN:	New York Public Library, New York, N. Y.
NNA:	American Geographical Society Library, New York, N. Y.

Other symbols:

*	before an entry indicates a good data source.
†	before an entry indicates a good bibliography.
!	before an entry indicates a synoptic case history study accompanied by charts.

Geographic locations are in the English form rather than the form used locally, for example, Moscow for Moskva.

Titles of articles or monographs are in the language of the original article unless otherwise stated. Slavic (Cyrillic) titles are transliterated into the Roman alphabet according to the Library of Congress transliteration scheme.

Abbreviations:

Titles of periodicals are not abbreviated, as a rule.

The months of the year from March to July are not abbreviated. Other months are abbreviated as Jan., Feb., Aug., Sept., Oct., Nov., and Dec.

The word or abbreviation for Volume (Tom, Band, Jahrgang, Año, etc.), for Number (Heft, Fascicule, Vypusk, etc.) and for page or pages is omitted from most entries. Thus an entry will read as follows:

Meteorologische Rundschau, 2(5/6):146-151, May/June 1950.

This indicates that the article appeared in *Meteorologische Rundschau*, Jahrgang 2 (Vol. 2), Heft 5/6 (No. 5/6), pages 146-151, May/June 1950.

PART I. ABSTRACTS OF CURRENT METEOROLOGICAL MATERIAL

WORKS OF SPECIAL INTEREST

5.1-1

551.5:63(02) 551.582(439.1)

*Aujeszký, László; Berényi, Dénes and Béll, Béla, *Mezőgazdasági meteorológia; Az agrometeorológiai ismeretek kézikönyve*. [Agricultural meteorology; an agrometeorological handbook.] Budapest, Akadémiai Kiadó, 1951. 550 p. 300 illus. refs. **DLC**—This text is intended for the general reading public, the college student and the research scientist as well. It comprises a useful handbook of meteorology, climatology and their agricultural applications, especially for those working on Central European crop ecology. In Pt. 1 (p. 15-271) basic information on meteorological elements, meteorological research, atmospheric dynamics, climatology and world climate is presented in a clear and analytical manner. A special section deals with the climate of Hungary (illustrated with numerous climatic charts). Pt. 2 (p. 275-417) deals with atmospheric phenomena and climatic factors from the point of view of their effect on the development of plants; with weather requirements of plants at various stages of their development, with microclimate and with the utilization of meteorological information for agricultural purposes. Pt. 3 (p. 421-541) contains data on the ecology of 17 principal crops grown in Hungary. It also includes a chapter on the dependence of growing climate on soil properties and one on forest climate. The use of this extensive study as a reference book is facilitated by a subject index. *Subject Headings:* 1. **Meteorology** 2. **Climate of Hungary** 3. **Agricultural meteorology** 4. **Plant ecology** 5. **Textbooks** 6. **Hungary**.—G.T.

5.1-2

551.555.6:551.594.25:551.578.4(99)

Barré, M., *Propriétés électriques du blizzard*. [Electrical properties of blizzards.] *Annales de Géophysique*, 9(2):164-183, 1953. 22 figs., refs. **MH-BH**—An extensive and intensive account of an unplanned investigation of the electrical effects of blizzards on antennas in use at Adélie Land during the 1951 expedition. Radio reception from Washington (WWV) or Hawaii (WWVH) was disturbed for 80 hours in the month of March 1951—sometimes for a day at a time. The special antennas, circuits connected with recorders, recorder records during blizzards showing slow development of charges in antennas and excellent photographs of antennas and exposure in connection with terrain and snow are reproduced. Temperature effect and wind effect vary with 1) height of antenna and 2) type of blizzard. The two types of blizzard are (A) mostly falling snow and (B) blowing snow. The first type occurs mainly in winter and usually results in positive charges—more pronounced in the high antenna. Type B occurs usually in spring and is not complicated by containing a mixture of snow flakes and blowing snow as is the case with type A. The crystals are always hard and the charges are negative with light winds and positive with strong winds. The blizzards at temperatures of 0° to -10°C do not affect radio reception very much. Positive charges are more frequent at temperatures > -15°C, and negative charges more frequent at < -15°C. Strong charges occur with strong winds and great density of the blizzard, but the opposite is not always the case. The noise shows a straight line relation to wind and density of snow. Finally, the vertical structure of 13 blizzards is shown graphically, together with visibility, wind speed and size of particles. The density was measured in terms of water content of snow caught in boxes at 15, 65, 115, 165 and 215 cm above the ground. It showed a rapid decrease in density of the first meter with type B blizzards, but a much slower decrease in general for type A (through more variability because of varying winds and amounts of blowing snow in type A). Results at Adélie Land are not in agreement with those of Mt. Washington (SCHAEFER, 1947) because of greater amount of blowing (hard) snow in blizzards at the former

station. *Subject Headings*: 1. Snow static 2. Vertical structure of blizzards 3. Blizzard electrical charges 4. French Antarctic Expedition 1951 5. Adélie Land, Antarctica.—*M.R.*

5.1-3

551.584(02):551.586:63

†*Brooks, F. A. (*Calif. Univ. at Davis*), **Climatic environment: a thermal system.** Syllabus for Agricultural Engineering 106, University California at Davis. Aug. 1951. 153 p. numerous figs., graphs, bibliog. at end of each part, eqs. Mimeo. **DWB**—This syllabus comes the nearest to a textbook on micrometeorology (in the applied sense) of any American contribution. Pt. I contains 3 major chapters on: a) the atmosphere, b) world temperature, wind, precipitation and climate and c) air masses, fronts, disturbances and weather maps. Pt. II takes up daytime thermal processes (solar energy, conduction, convection, diffusion, evaporation and heat balance). Pt. III has 5 chapters on nighttime thermal processes (radiational cooling, air draft, heat balance and frost protection). Pt. IV deals with local and regional agricultural climatology. *Subject Headings*: 1. Agricultural climatology 2. Micrometeorology 3. Textbooks.—*M.R.*

5.1-4

551.586:61

Dordick, Isadore L., **Climate and work in Australian New Guinea.** *Acta Tropica*, Basel, 10(3):233-250, 1953. 3 figs., 9 tables, 15 refs. Abstracted from reprint. In English; French and German summaries. **DLC**—Available data for temperature, vapor pressure and wind speed are summarized, giving annual mean seasonal variation and change with elevation. "Effective temperatures" are computed as an index of the climatic comfort, according to norms, established by the Committee on Atmospheric Comfort of the American Public Health Association. The index varies between 75 and 79° at wind speed of 20 ft/min⁻¹ and between 72 and 76° at 200 ft/min⁻¹ for Lowland New Guinea, compared with the tolerance limit of 85° for light sedentary activity and 80° for heavy work. Therefore an efficient performance of severe physical and complex mental activities can be expected from acclimatized white men. Even more favorable is the climate on the Central Plateau with an elevation of about 5000 ft. *Subject Headings*: 1. Comfort climate 2. Tropical bioclimatology 3. Australian New Guinea.—*A.A.*

5.1-5

551.551(08)

International Symposium on Atmospheric Turbulence in the Boundary Layer, Massachusetts Institute of Technology, June 4-8, 1951, [Proceedings]. Organized jointly by the Dept. of Meteorology of the Massachusetts Institute of Technology and the Geophysics Research Directorate of the Air Force Cambridge Research Center under Contract AF 28(099)-7. *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers*, No. 19, Dec. 1952; *AFCRC Technical Report* 53-9. 530 p. numerous figs., refs., tables. **MH-BH**—This is the first large international symposium devoted exclusively to atmospheric turbulence with numerous contributions by the best American, British, German, French, Australian and Japanese specialists in this field. Three papers deal with the present position in turbulence research and unsolved problems, 4 papers with evaporation and the air-ocean interface, 13 papers are devoted to the structure of turbulent flow and its observation, with a summary of experimental work, carried out in the United States. Ten papers study eddy fluxes and eddy diffusion, the effect of turbulent flow on the vertical transfer of heat, moisture and momentum, as well as the statistical properties of turbulence. Carefully summarized and edited discussions at the end of each paper and for the whole symposium, increase the value of the volume considerably. Numerous results of experiments can be found in the individual papers; for example, data on the performance of observational equipment, autocorrelation and vertical profiles of wind and temperature, frequency distribution of wind fluctuations, bubble release, photographic observations, etc. Abstracts of the single papers will be published separately. *Subject Headings*: 1. Atmospheric turbulence 2. Turbulence observations 3. International symposia. I. Hewson, E. W. (ed.) II. Massachusetts Institute of Technology. Dept. of Meteorology III. U. S. Air Force. Cambridge Research Center IV. Contract AF 28(099)-7.—*A.A.*

5.1-6

551.593.54

†Penndorf, Rudolf, **On the phenomenon of the colored sun, especially the "blue" sun of September 1950.** *U. S. Air Force. Cambridge Research Center, Geophysical Research Papers*, No. 20, April 1953. *AFCRC Technical Report*, 53-7. 41 p. 12 figs., 9 tables, bibliog. p. 41. **DWB**—This paper presents a thorough and systematic analysis of the optical conditions necessary for a colored sun or moon (red, blue or green) and of the conditions actually or theoretically present at the time of the "blue" sun of Sept. 1950. First there is a theoretical discussion of large particle scattering, then a review of observations made of the smoke and radiation conditions during the Sept. 1950 phenomena (3 sets of measurements of radiation were obtained in 1) Gotha, Germany, 2) Bergedorf, Germany and 3) in Edinburgh, Scotland). Unpublished color photographs were made at the Naval Observatory in Washington, D. C. The extinction coefficients are given, the radius and number of particles discussed in theory and related to observations, the anomalous extinction between 3500 and 7000 Å for Sept. 1950 treated quantitatively, the spectrum and intensity of a blue and a green sun and the physiological impression of such spectra analyzed, with a conclusion that the reports of "blue" sun are correct. MIE's theory of large particle scattering is applied and the radius of particles calculated as 0.5 to 0.8 μ with a concentration of 175 to 127 per cm^3 . With assumption of 3 size spectra, and of spherical particles (since non-spherical particles have an extinction coefficient differing by <10% from spherical), the intensity distribution of solar spectrum from 3500 to 7000 Å gives a maximum between 4100 and 4600 Å, similar to that which would appear during a dust storm if particles were of a 0.3 μ size and total number of $>10^8/\text{cm}^3$ column. *Subject Headings*: 1. Blue sun 2. Smoke pall—Sept. 1950 3. Extinction coefficient 4. Atmospheric optics.—*M.R.*

5.1-7

551.511:016

†**Physical Review Index, 1921-1950, v. 17-80.** Prepared under the direction of J. W. Buchta. Published for the American Physical Society . . . by the American Institute of Physics. N. Y., 1952. [2 v.] Separate author and subject indexes. A previous index, 1893-1920, pub. 1921, indexes v. 1-15, 1893-1912, and Series 2, v. 1-16, 1913-1920. **DLC**—In the voluminous Subject Index (500 p.) the section on Geophysics covers 7, 2-column pages (p. 196-202) and contains subheadings entitled: (167) Atmosphere—absorption spectra, aurora, night sky, (168) Atmosphere—composition, (169) Atmosphere—electrical phenomena, (170) Atmosphere—general, (171) Earth—age, (172) Earth—general, (173) Earth—magnetism, (174) Earth—radioactivity; over 400 references in all. Material of interest is also found under (57) Cosmic rays—atmospheric effects, (111) Lightning and (134) Electromagnetic propagation. In the Author Index (540 p.), hundreds of pertinent articles can be located by reference to works of such prolific writers as E. O. HULBERT, JOSEPH KAPLAN, O. R. WULF, ROSS GUNN, S. J. MAUCHLY and other outstanding physicists. All in all, this work and its predecessors constitute a very valuable contribution to the bibliography of the physics of the atmosphere, especially for those who do not read any language but English. *Subject Headings*: 1. Bibliographies 2. Cumulative indexes 3. Physics of the atmosphere. I. American Physical Society II. American Institute of Physics III. Buchta, J. W. (ed.)—*M.R.*

5.1-8

551.511:536.2

†*Ramdas, L. A. (Poona, India), **Convective phenomena near a heated surface.** *Indian Academy of Sciences, Proceedings, Sec. A*, Bangalore, 37(2):304-317, Feb. 1953. 5 figs., 1 table, plate. **DLC**—The author summarizes and analyzes the results of numerous experiments (since 1930) with rising currents of air above a heated plate (2 cm sq) and above heated ground. Lapse rates 2 million times the adiabatic were found just above the ground and 2000 $\times$ adiabatic at 30 cm height, whereas at 7.5 m above ground the rate was 6 $\times$ adiabatic. (Data from Poona, April 1950.) The patterns observed above a hot plate, as observed from smoke ascending around the plate, give an analogy to that above heated ground. The free areas are sharply contrasted with the smoky areas. The rising columns of air are similar to the shimmering areas seen above hot roads or fields, and the height to which the columns rise is called the top of the shimmering area. The lapse rates and fluctuations in temperature and height of the top of this layer were measured carefully with extremely small copper-

constantan thermocouples and recorders, and the conditions in the first mm above the plate by means of interferometric techniques. The conditions which attend the development of the nocturnal inversion in the evening and its destruction after sunrise are shown diagrammatically for the lower 300 m on the basis of these and field measurements. Finally, a thermal repulsion apparatus which studies conditions of convection beneath the hot plate is described. When dust particles are repelled uniformly and deposited on the plate a condition of no convection is reached. The remarkable point in these experiments is the maintenance of the convective pattern without turbulence even when considerable wind shear occurs. In such cases the long spindly convective cells merely lean one way or another but are not destroyed. [Under such conditions of lapse rate and convection, how can theoretical calculations of turbulence be made for the microclimatic layer? *ed.*] A set of 4 series of temperature records made at 18 different heights from 0.5 mm to 913 cm at 0630, 1000, 1400 and 1700h at Poona, shows the height to which the convective cells rise at different times of the day, at 0630 top = 1 to 2 cm, at 1000 and 1400—9 cm, and at 1700—10 cm. Finally, a good list of references to studies on this subject made in India from 1932–1951 by the author and his associates is added. *Subject Headings:* 1. Extreme lapse rates 2. Convection above heated ground 3. Convection over hot plates 4. Top of convective layer 5. Poona, India.—M.R.

5.1–9

551.510.42:06

United States Technical Conference on Air Pollution, Washington 1950, **Air pollution**. New York, McGraw-Hill, 1952. 847 p. figs., tables, refs. DWB—An interdepartmental conference on air pollution was arranged by representatives of the U. S. Weather Bureau, Public Health Service, Bureau of Standards, Dept. of Agriculture, etc. (among whom were Col. B. G. HOLZMAN, SVERRE PETERSSSEN, HARRY WEXLER and DR. H. E. LANDSBERG). The conference took place on May 3–5, 1950 in Washington, D. C. General panel discussions at the various sessions are reported in the first 33 pages of the sizable volume. The rest of this volume constitutes a compendium of articles by numerous authorities in every field of air pollution research and control. The 97 articles are arranged into 7 panels: 1) Agriculture, 2) Analytic methods and properties, 3) Equipment, 4) Health, 5) Instrumentation, 6) Legislation and 7) Meteorology. Articles of meteorological interest are to be found in all parts of the volume. A detailed index is appended. Individual articles will be abstracted separately and published later. *Subject Headings:* 1. Atmospheric pollution 2. Atmospheric pollution control 3. Compendiums 4. Conferences.—M.R.

GENERAL METEOROLOGY

See also: **Agricultural meteorology** (Aujeszký, Berényi, Béll), 5.1–1; **Bibliography on general oceanographic meteorology**, p. 75–123.

5.1–10

551.5(04)

Barnett, Lincoln, **The world we live in, Pt. IV. The canopy of air**. Life, Chicago 34(23):74–98, June 8, 1953. 31 illus. (some in color). DLC—One of the most beautifully illustrated popular articles on the atmosphere, clouds, auroras, winds, fronts, storms, lightning, rain, climate, etc. ever published. Most of the colored pictures are exceptional in vividness of contrast. A large colored model of the atmospheric structure from the surface to 400 mi, one of a wave in the lee of the Sierras, and one of a thunderstorm in Arizona are the most striking of all. Four unusual auroras are similarly illustrated in color. The text is scientifically accurate. The text and illustrations were compiled with the advice and help of 33 “big name” meteorologists or geophysicists in a dozen United States, Canadian and Norwegian Institutions. This and others in this series of articles on Geology, Oceanography, etc. represents popular science at its best. *Subject Headings:* 1. Popular meteorology 2. Atmospheric structure 3. Auroral photographs 4. Origin of atmosphere.—M.R.

5.1–11

551.5(04)

Cook, J. Gordon, **Can science stop it raining? Featuring the weather, with 10 other science stories for the non-technical reader**. *Spotlight on Science*, Guildford, Surrey, England, No. 2, 1951. 58 p. Price: 2s. DWB—Half of the 16 chapters of this science booklet deal

with meteorology or related subjects. The history of meteorology and weather forecasting, the climate of Great Britain, large-scale climatic changes, artificial control of precipitation, solar energy utilization and cosmic radiation are discussed in simple terms. *Subject Heading: Popular science books.—G.T.*

5.1-12

551.5(04)

Ficker, Heinrich von (*Univ. of Vienna*), **Wetter und Wetterentwicklung**. [Weather and its formation.] Berlin, Springer-Verlag, 1952. 4th enl. ed. 140 p. 42 figs. Append: Examples of weather charts. *Verständliche Wissenschaft*, Berlin, v. 15. **DLC**—This popular pocket edition is the standard meteorological textbook for the interested layman in Germany. The author avoids a lengthy discussion of instruments and observation methods but aids the deeper understanding of weather processes in a competent manner. The main objects discussed are: radiation, clouds, fronts, föhn, tornadoes, cyclones, anticyclones, weather maps and weather forecasting. An appendix of 11 weather maps characterizes typical synoptic situations for cold waves, radiation weather, storms, thaw weather, killing frost, floods, etc. *Subject Heading: 1. Popular science books.—A.A.*

5.1-13

551.5(046)

Reichelderfer, Francis W., **What's wrong with the weather?** *U. S. News and World Report*, Wash., D. C., 34(26):50-54, 59-66, June 26, 1953. port., diagrs. **DLC**—An extensive interview between DR. REICHELDERFER, chief of the U. S. Weather Bureau, and the editors of the *U. S. News and World Report* wherein the author gives the latest official information or opinions on the possibility of atomic explosions influencing the weather (i.e., tornadoes), on the warming of the Arctic, radiation effects of atomic explosions, progress in forecasting tornadoes and hurricanes, long range forecasting and international cooperation in interchange of weather information. It is concluded that the energy of an atom bomb is too small to influence the large-scale weather processes or even hurricanes. *Subject Headings: 1. Atomic explosion effects 2. Forecast accuracy.—M.R.*

5.1-14

551.5(09)

K——, J., **Mit nyujt az ötéves terv a meteorológiának?** [What does the five-year plan offer to meteorology?] *Időjárás*, 55(7/8):192-194, July/Aug. 1951. illus. on front cover. **DLC**—Appropriations made available through the Hungarian five-year plan will permit extension and intensification of meteorological services, research and education. A new observatory (to be one of the most up-to-date in Europe) is being constructed near Budapest; meteorological stations are receiving better equipment; several regional observatories and mountain observatories are being established; regular synoptic and aerological services have been introduced; daily and monthly bulletins appear in increased volume; the Meteorological Institute's "Yearbook" will appear more regularly. Forecasting techniques are said to have been improved by adopting methods acquired from Russian scientists and a department of meteorology has been founded at one of the Budapest universities. *Subject Headings: 1. Progress in meteorology 2. Meteorological service development 3. Hungary.—G.T.*

5.1-15

551.5(09)(73)

Troll, Karl, **Fortschritte der Meteorologie**. [Advances in meteorology.] *Erdkunde*, Bonn, 7(3):236, 1953. 5 refs. **DLC**—Account of recent publications of the American Meteorological Society: "Compendium of Meteorology," *Meteorological Abstracts and Bibliography*, with brief references to *Bulletin*, *Journal* and *Meteorological Monographs*. *Subject Headings: 1. Progress in meteorology 2. American Meteorological Society.—C.E.P.B.*

5.1-16

551.5:6

Reichelderfer, Francis W. (*Chief, U. S. Weather Bureau*), **The United States Weather Bureau and Industry**. *Weatherwise*, 6(2):31-32, 62, April 1953. **DWB**—The scope of the U. S. Weather Bureau's service to business, agriculture, industry and the general public is indicated in this brief article. Numerical values or estimates of the number of reports of various kinds, the number of damaging storms of various kinds and the percentage of the Weather Bureau's efforts that go to the different services are given. *Subject Headings: 1. Industrial meteorology 2. Meteorological services 3. U. S. Weather Bureau.—M.R.*

5.1-17

551.5:659.255

Smith, Charles Pennypacker (*Pacific Gas & Electric Co.*), **Meteorology in a public utility.** *Weatherwise*, 6(2):49-50, April 1953. DWB—The Pacific Gas and Electric Co. maintains its own weather forecasting unit to provide the operations department with information as to the temperature, wind, cloudiness and precipitation which may be expected in the next 24 to 366 hours. A 1°F drop in temperature will increase demand for gas by 28 million cu.ft. (in Northern and Central California where 1,100,000 customers use the flow from 48 gas fields). Forecasts are also made for construction, maintenance and hydroelectric activities; climatological summaries and analyses are also provided for design of planning. Forecasts are prepared 7 days a week in winter, by one full time and 2 relief meteorologists; their spare time in summer is used in studies and research. *Subject Headings*: 1. **Industrial meteorology** 2. **Public utilities forecasting** 3. **Northern California.**—*M.R.*

5.1-18

551.5:659.255

Steele, Thornton A. (*Western Reserve Univ.*), **A department store uses weather.** *Weatherwise*, 6(2):42-43, April 1953. DWB—A sales expectancy index compiled from a regression equation combining effective temperature (temperature and wind) (*T*), precipitation (*P*), depth of snow (*D*), and percentage of sunshine (*S*), was worked out for the Younkens Department Store in Des Moines, Iowa, for early Easter and late Easter seasons, respectively, and an example of its use cited and illustrated graphically. The value of such an index in planning future sales, evaluating actual sales, effectiveness of advertising, etc. is brought out. Good forecasts can add to the value of these aids to business. *Subject Headings*: 1. **Industrial meteorology** 2. **Sales expectancy indexes.**—*M.R.*

5.1-19

551.5:63(09)

Habermehl, R., **Zwei Jahrzehnte Agrarmeteorologie.** [Two decades of agricultural meteorology.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 42:430-433, 1952. fig., 4 refs. DWB—History of development of agricultural meteorology in Germany before the war and in the U. S. Zone since the war, with programs of research institutes. *Subject Headings*: 1. **Agricultural meteorology** 2. **History of agricultural meteorology.**—*C.E.P.B.*

5.1-20

551.5:63

Maksimov, S. A., **Meteorologiya i sel'skoe khoziaistvo.** [Meteorology and agriculture.] Leningrad, Gidrometizdat., 1952. 94 p. 25 figs., 15 tables. Price: 2 rubles. DLC—Includes short history of agricultural meteorology in Russia (beginning with LOMONOSOV, 1759) with considerable attention paid to the organization of agrometeorological service in the U.S.S.R. since the Revolution. The work at agrometeorological stations is described. The effects of radiation, soil and air temperatures, snow cover and its conservation, soil moisture, humidity and wind on crops are treated in separate chapters based on actual data from crop growth in U.S.S.R.; harmful meteorological conditions such as drought, hot winds, hail, frost, cloudbursts, glaze, and intense freezing; the means by which the agrometeorological service helps agriculture (forecast, warnings, studies, etc.) and, finally, on the transformation of nature in the U.S.S.R. according to the ideas of MICHURIN and LYSENKO (effect of shelter belts, etc.) are reviewed. *Subject Headings*: 1. **Agricultural meteorology** 2. **U.S.S.R.**—*M.R.*

5.1-21

551.5:63

Watson, Sir James Scott, **Meteorology and agriculture.** *Weather*, 8(7):202-205, July 1953. MH-BH—Popular article on scientific adaptation of cattle, pigs, grass and crops to different climates, on watering crops and on agricultural forecasts. *Subject Heading*: 1. **Agricultural meteorology.**—*C.E.P.B.*

5.1-22

551.5:92

Arakawa, H., **Dr. Robert D. Fletcher no danwa.** [Conversation with Dr. Robert D. Fletcher.] *Meteorological Society of Japan, Journal, 2nd Ser.*, 30(11):371-377, Nov. 1952. 3 figs. In Japanese. MH-BH—Account of interviews with DR. FLETCHER of the U. S. Weather Bureau during his visit to Tokyo in July 1952. DR. FLETCHER's scientific activities,

pecially his work in the field of hydrometeorology and wind, wave and swell analysis are discussed and illustrated with diagrams. The author also mentions several suggestions he made to the visitor regarding the development of scientific research groups in Japan, including the establishment of a typhoon project to be attached to the World Meteorological Organization or its Regional Association II. *Subject Headings:* 1. Public relations 2. Fletcher, Robert D. —G.T.

5.1-23

551.5:92:016

†Raman, Sir C. V., Dr. K. R. Ramanathan on his sixtieth birthday. *Indian Academy of Sciences, Proceedings, Sec. A*, Bangalore, 37(2):167-174, Feb. 1953. bibliog. p. 169-174. **DLC**—This excellent issue of the *Proceedings* is dedicated to DR. K. R. RAMANATHAN and contains a number of articles by fellow meteorologists in India and various parts of the world (RAMDAS, ÅNGSTRÖM, PETTERSSSEN, VÄISÄLÄ, VAN MIEGHEM, VASSY and VASSY, PALMÉN, MYERS and others). A good photograph and a tribute together with a list of 42 important papers on upper atmosphere physics, synoptic meteorology, climatology, etc. are presented as an introduction. *Subject Headings:* 1. Biography 2. Ramanathan, K. R. 3. Commemoratives 4. Bibliographies.—M.R.

METEOROLOGICAL OBSERVATIONS AND INSTRUMENTS

METHODS OF OBSERVATION

See also: Synoptic code, 1949 (U. S. Weather Bureau), 5.1-84; Monthly mean temp. based on thrice daily synoptic observations (Dedebant, Machado), 5.1-173; Measurement of thermal conductivity of snow (Yosida), 5.1-239; Sublimation in snow layer (Yosida, Kuroiwa), 5.1-240; Snow survey for stream flow forecasting (Boardman), 5.1-242; Measurement of mass and number of falling snow crystals (Kumai, Higuchi), 5.1-245; Snow cover observations in vicinity of shelter belts (Parshin, Salov), 5.1-248; Soil moisture measurement by electrical method (Baier), 5.1-251; Soil moisture measurement (Ivanov), 5.1-255; Soil moisture measurement (Kubo), 5.1-256.

5.1-24

551.501:551.508.91:535.56

Kerker, Milton and Hampton, Merle I. (*Dept. of Chem., Clarkson Coll. of Tech., Potsdam, N. Y.*), The use of unfiltered light in determining particle radius by the polarization ratio of the scattered light. *Optical Society of America, Journal*, 43(5):370-372, May 1953. 5 figs., 5 tables, refs. **DLC**—The light scattering technique of determining the radius of small spherical particles by measurement of the polarization ratio is extended to the case of non-monochromatic light. The new method is applied to sulfur and dibutyl phthalate aerosols radiated by an unfiltered beam from a mercury vapor lamp. The radii obtained with the unfiltered light are in agreement with those obtained when monochromatic light is used. *Subject Headings:* 1. Aerosol measurement 2. Polarimeters.—Authors' abstract.

5.1-25

551.501:551.574.1

Nolan, P. J. and Kenny, P. J., Anomalous loss of condensation nuclei in rubber tubing. *Journal of Atmospheric and Terrestrial Physics*, 3(4):181-185, May 1953. 13 refs., 4 eqs. **DWB**—Various formulas for diffusion loss of particles passing through narrow tubes or channels are collected. Loss of nuclei in a short length of rubber tubing, about 10%, was much larger than given by these formulas. Loss was measured under different conditions and remedial measures described. *Subject Headings:* 1. Nuclei count 2. Diffusion through rubber tubing.—E.P.B.

5.1-26

551.501:551.577:551.43

Grunow, J., Niederschlagsmessungen am Hang. [Precipitation measurements on a slope.] *Meteorologische Rundschau*, 6(5/6):85-91, May/June 1953. 6 figs., 4 tables, 20 refs. **DWB**—Gages with horizontal opening receive much too little on windward mountain slopes especially in snow and somewhat too much on leeward slopes. Errors are calculated and compared with observations on a 20° slope on Hohenpeissenberg. Deficit on windward slope

13-48%, excess to leeward 5%. Ratios and angle of fall are calculated in terms of daily amount and type of precipitation and a geometrical method of correction presented. The exposure of a gage for hydrological purposes is discussed. *Subject Headings: 1. Precipitation measurement 2. Mountain observations.—C.E.P.B.*

5.1-27

551.501:551.577.2(771)

Sanderson, Earl E. and Johnstone, Don O. (*Ohio State Dept. of Natural Resources Columbus*), **Accuracy of determination of annual precipitation over a given area.** *American Geophysical Union, Transactions*, 34(1):49-57, Feb. 1953. 8 figs., 2 tables, 3 refs., 2 eqs. **MH-BH**—An attempt to develop methods for computing the accuracy with which groups of gages of either regular or irregular spacing measure the annual precipitation amount over areas of various sizes. Study based on a dense network established in the Muskingum River watershed and near Wilmington, Ohio. Author discusses accuracy of the Thiessen method and of isohyetal maps. No distinction was made between the orographic influence and the purely meteorological variability. *Subject Headings: 1. Areal precipitation distribution 2. Representativeness of observations 3. Ohio.—A.A.*

5.1-28

551.501:551.578.4

Garstka, Walter U., Criddle, Wayne D., Rhodes, Forrest L. and others (*U. S. Bureau of Reclamation, Hydrology Branch, Project Planning Div., Denver*), **Report of the Committee on Snow, 1950-1951.** *American Geophysical Union, Transactions*, 34(1):125-132, Feb. 1953. **MH-BH**—Survey of current activity in the United States, Canada and Japan consisting of 26 short reports. Among the topics covered are: frozen ground, classification and mechanical properties of snow, melting of snow, evaporation and runoff from snow, snow surveys, orographic and forest influences, frost observations, river ice, avalanche hazard forecasting, snow crystals, use of radar, etc. *Subject Headings: 1. Snow research 2. A.G.U. Committee on Snow 3. United States 4. Canada 5. Japan.—A.A.*

5.1-29

551.501:551.578.4

Rhodes, F. L. and Wilson, W. T., **The Cooperative Snow Investigations Program. Its objectives and operations.** *International Union of Geodesy and Geophysics, International Association of Scientific Hydrology, [Transactions] Oslo 1948*, 2:69-85, [1949]. 12 figs. Also in: *Western Snow Conference, Proceedings 1948*, p. 7-23, Feb. 1949. **DWB**—Various laboratories and programs of this organization initiated in 1945 by the U. S. Weather Bureau and Corps of Engineers in Sierras (Calif.), Willamette Basin (Oregon) and upper Columbia (Montana), and the details of the investigations being carried out therein are described. Maps show general location and detailed topography around each. Many photographs of exposures and equipment also included. *Subject Headings: 1. Cooperative snow investigations 2. Snow research 3. Western United States.—M.R.*

5.1-30

551.501.1:551.578.4

Villeneuve, G. Oscar (*Dir. Met. Bur. Quebec*), **Snow and skiing. Instructions for meteorological observers.** *Quebec (Province). Bureau de Météorologie, Bulletin*, No. 2, 2nd ed. Nov. 1947. In English and French. 6+7+p. illus. **DWB**—A leaflet containing basic instructions for observers appointed by the Meteorological Bureau of the Forest Protection Service in the Province of Quebec. Reports should include information on three factors: 1) height of last snowfall, 2) total height of snow and 3) state of snow surface. A glossary of terms used in snow description, and illustrations showing snow stakes and other instruments are added. *Subject Headings: 1. Instruction for observers 2. Snow cover.—G.T.*

5.1-31

551.501:551.591

Bouman, M. A. (*Natl. Res. Council, Soesterberg, Netherlands*), **Visual thresholds for line-shaped targets.** *Optical Society of America, Journal*, 43(3):209-211, March 1953. 2 figs., refs. **DWB**—Measurements of absolute and contrast thresholds values 7° nasal from the fovea for 6500 and 5250 Å for line-shaped targets 2' in width, length l between 2'-256' and time of observation t between 0.02-1 seconds are presented. The absolute thresholds agree with what was to be expected from the two-quanta theory. For $l > 32'$ for green flashes and for

$>8'$ for red ones, $\bar{N}_{60 \text{ percent}} \sim l^{\frac{1}{2}}$ and for $t > 0.1$ second, $\bar{N}_{60 \text{ percent}} \sim t^{\frac{1}{2}}$. When $t < 0.1$ second or $l < 32'$ for green and $l < 8'$ for red light, Bunsen-Roscoe's and Ricco's law, respectively, are valid. Also, predictions for the behavior of the contrast thresholds for line-shaped sources are made which are also based on the quanta theories for these visual functions. The dependence of the contrast threshold $(\Delta \bar{N}_{60 \text{ percent}})_{Av}$ on l for large l for line-shaped targets is equal to the dependence of $(\Delta \bar{N}_{60 \text{ percent}})_{Av}$ on t and corresponds with the dependence of $(\Delta \bar{N}_{60 \text{ percent}})_{Av}$ on t and on the diameter of d circular flashed in the way predicted by theory.

Subject Heading: 1. Contrast threshold.—*Author's abstract.*

5.1-32

551.501:551.591

Pinegin, N. I., Boldyrev, N. G. and Barteneva, O. C., **Raschet dal'nosti vidimosti.** [Calculation of the visual range.] *Akademiia Nauk, SSSR, Doklady*, 84(3):483-486, May 1952. g., 2 tables, 7 refs., 2 eqs. **DLC**—The author reviews the work of A. A. SMIRNOV on the determination of the threshold of discrimination of brightness as a function of the size of objects in cases where the objects were brighter than the background. The formula derived by SMIRNOV expresses a linear dependence of discrimination upon the logarithm of the contrast of objects. A formula for calculating the visibility distance of objects against a background of the sky on the horizon is given. It is: $L = S \frac{\frac{1}{2} \ln K}{\frac{1+\delta}{3.438} \frac{S}{\sqrt{q}} \frac{1}{\epsilon} \ln \frac{1}{z}}$, where L = distance of visibility

of the object; S = meteorological distance of visibility; K = contrast of object with background of the sky; q = area of the object; ϵ = threshold of contrast sensitivity of eye of observer; and z = minimum resolving angle. The results of an actual experiment and those obtained by this formula are compared; somewhat higher visibility data are obtained with the latter.

Subject Headings: 1. Visibility measurement 2. Contrast threshold.—*I.L.D.*

5.1-33

551.501.1(02)

Villeneuve, G. Oscar (*Dir. Bur. of Met., Quebec Province*), **Manuel de l'observateur en météorologie.** [Observers manual in meteorology.] *Quebec (Province). Bureau de Météorologie, Bulletin*, No. 12, 1949. 194 p. 75 figs. (inc. forms), 6 tables, 25 refs. **DWB**—A complete and nicely edited manual for observers at the 200 or more stations in the network of the Provincial Bureau of Meteorology of Quebec. The manual begins by explaining the meteorological needs of agriculture, navigation, aviation, silviculture, health, justice, fisheries, sports, hydrology, industry, commerce, insurance, etc., and how the Quebec Met. Bur. attempts to fill these needs, especially with the aid of half a dozen special research stations which are named. The location of instruments; types of observations, care and observing of instruments of all types and making of visual surface observations; the keeping and summarizing of forms and definitions of a number of special phenomena which are sometimes observed, together with useful conversion tables, are covered in the handbook (all in French). **Subject Headings:** 1. Observers manuals 2. Quebec Province, Canada.—*M.R.*

5.1-34

551.501.3

Dreyer, A. J., **South Africa introduces metric units.** *World Meteorological Organization, WMO. Bulletin*, 2(3):83-85, July 1953. **DWB**—Practical details connected with the recently completed replacement of thermometer and rain gages scaled in Fahrenheit and inches by equipment calibrated in centigrades and millimeters are described. The operations involved in the Union of South Africa, British South West Africa, Bechuanaland, Basutoland and Swaziland. A world map shows territories where metric units are in use (67% of the globe's land surface, excluding Greenland and Antarctica). **Subject Heading:** 1. Units. —*G.T.*

5.1-35

551.501.3:001:06

*World Meteorological Organization, **Value of some physical functions and constants used in meteorology [and] Definitions and specifications of water vapour in the atmosphere.** *World Meteorological Organization, I.M.O. Publication*, No. 79, 1951. 92 p. tables, ref., 1 eqs. In English and French. Price: Sw. Fr. 2. **DWB**—Report of subcommission and decisions of the Conference of Directors (1947) on composition of dry air, temperature scale,

energy equivalent of calorie, unit of geopotential, gravity, gas constants, enthalpy and specific heat of dry air and of water substance, saturation vapor pressure, etc. The second part gives definitions of mixing ratio, specific humidity, absolute humidity, vapor pressure, saturation vapor pressure, dew point and frost point temperature, relative humidity, thermodynamic wet bulb and equivalent temperature. *Subject Headings:* 1. Constants 2. Units 3. Water vapor 4. Definitions.—A.A.

5.1-36

551.501.4:551.506.3 (431/5) (09)

Hommel, Karlheinz, *Der Anschluss der alten Hohenpeissenberger Beobachtungsreihe an die Messungen bei der neuen Aufstellung auf Grund zweijähriger Vergleichsablesungen.* [The reduction of the old Hohenpeissenberg records to those at the new site by means of a two years' comparison.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 42:57-62, 1952. 7 tables, 3 refs. DWB—The history of the station since 1781 is summarized. The earlier window screen was compared with the new free screen and the rain gage exposures compared, by parallel observations April 1950-March 1952. The resulting corrections are discussed in detail. *Subject Headings:* 1. Long period records 2. History of meteorological stations 3. Record reduction 4. Hohenpeissenberg, Germany.—C.E.P.B.

OBSERVATIONAL DATA

See also: Reduction of old Hohenpeissenberg records . . . (Hommel), 5.1-36; Radiosonde and rawinsonde code (U. S. Weather Bureau), 5.1-83.

5.1-37

551.506(52):551.433

Huzimura, I., Shida, I., Fukushima, M. and others, *On the changes of meteorological elements with heights.* *Tateno, Japan. Aerological Observatory, Journal*, 5(1):94-96, March 1951. DWB—Temporary observations were made during 12 days at 6 stations on the slope of Mt. Fuji from 20 to 3776 m above MSL. Results for mountain and valley breezes obtained. Lapse rate temperature greatest in middle zone. Diurnal course of relative humidity and wind velocity at upper stations inverse to that of lower stations. *Subject Headings:* 1. Vertical variations of meteorological elements 2. Mountain observations 3. Mt. Fuji, Japan. I. Shutara, E. II. Shizaki, D. III. Ito, S. IV. Murakoshi, N.—A.A.

5.1-38

551.506:551.524(52)

*Kato, T. (*Seikei Univ.*), *Air temperature in Tokyo and its neighbourhood.* *Meteorological Society of Japan, Journal, 2nd Ser.*, 30(11):365-371, Nov. 1952. 5 figs., 2 tables. In Japanese, English summary p. 305. MH-BH—Data on maximum and minimum temperatures of some 100 stations in and near Tokyo are tabulated and discussed. Daily and annual mean maximum and minimum temperature distribution and annual mean temperature distribution are shown in charts. The period covered is 1926-1945. *Subject Headings:* 1. Temperature data 2. Temperature distribution 3. Tokyo, Japan.—G.T.

5.1-39

551.506(438)

*Kosiba, Aleksander (ed.), *Observacje dobowe we Wrocławiu.* *Observations journalières à Wrocław* 1950. [Daily observations at Wrocław, 1950.] *Wrocław. Obserwatorium Meteorologii i Klimatologii, Prace*, No. 5:4-48, 1952. 13 tables. In Polish; legends and summary (p. 59) in French. DWB—Complete observational data (three times daily) for the usual climatological elements, including also visibility and sunshine duration. Monthly summaries give also deviation from mean. Weather processes in 1950 are reviewed in detail. *Subject Headings:* 1. Observational data 2. Wrocław, Poland.—A.A.

5.1-40

551.506:551.524.3(494)

*Plantamour, E. (*Prof. Astron., Acad. de Genève*), *De la température à Genève d'après vingt années d'observations, 1836 à 1855.* [The temperature at Geneva based on 20 years of observation, 1836 to 1855.] *Société de Physique et d'Histoire Naturelle de Genève, Mémoires*, 14(2), 1857. 42 p. tables. Abstracted from reprint. DWB—Data presented and methods

calculation discussed in this study include values of diurnal and annual variation in temperature, of monthly means and extremes and of mean temperature at Geneva for each decade from 1836 to 1855 inclusive. Probable errors of the means are indicated. *Subject Headings:* Temperature data 2. Temperature variations 3. Geneva, Switzerland.—G.T.

5.1-41 551.506:517.512.2

Samatan, Enrique L., *Método simplificado de análisis armónico*. [Simplified method of harmonic analysis.] *Meteoros*, Buenos Aires, 2(1/2):112-116, Jan./June 1952. eqs. English summary p. 112. DPA—The derivation of a simple method for harmonic analysis of empirical data is presented, and its application to harmonic analysis of diurnal variations of atmospheric pressure in Argentina cited. The method consists of isolation of harmonics by means of addition and subtraction of more and more restricted groups. *Subject Headings:* 1. Harmonic analysis 2. Statistics in meteorology.—M.R.

5.1-42 551.506:551.551(71)

*Thomas, M. K., *Computed gust speeds in Canada*. Canada. *Meteorological Division*, Circular 2328, Tec. 158, July 14, 1953. 10 p. mostly tables, 4 refs. DWB—From simultaneous records obtained with Dines pressure tube recording anemometers and with cup anemometers, the author derived two empirical formulas ($V_G = 19 + 1.22 V_M$ and $V_G(\max.) = 25 + 1.22 V_M$) for the relationship between most probable gust speed (V_G) and speed averaged over an hour from the cup anemometer (V_M), and between computed maximum gust speed ($V_G(\max.)$) and V_M respectively. Values of V_M are tabulated for 235 stations throughout Canada and computed values of V_G and $V_G(\max.)$ are added wherever (in some 200 cases) V_M exceeds 35 mph (at hourly speeds below 35 mph no relationship exists between gusts and corresponding hourly speed). *Subject Headings:* 1. Gust velocities 2. Gust data 3. Wind data 4. Canada.—G.T.

5.1-43 551.506:551.524(71)

*Thomas, M. K. (*Met. Div. Toronto*), *Winter temperature in Toronto*. *Royal Meteorological Society, Canadian Branch [Publications]*, 4(3), 1953. 10 p. 12 figs., 5 tables, 12 refs. DWB—A continuous record of daily temperature is available for Toronto since 1841. The averages, extremes, and the frequency of extremes for the winter months are listed and discussed. The significance of the position of Toronto in the zone of the westerlies and in the Great Lakes region is noted and comparisons are made with stations of similar latitude. Long term temperature trends and the differences between downtown and suburban temperatures are considered. *Subject Headings:* 1. Winter temperatures 2. Temperature data 3. Urban climates 4. Toronto, Canada.—*Author's abstract*.

5.1-44 551.406.1(493):629.13

*Belgium. Service Météorologique d'Aviation. Régie des Voies Aériennes, *Bulletin mensuel*. [Monthly bulletin.] First issue received, Jan. 1950; last issued received, June/Aug. 1952. Subtitle on first page: *Climatologie Aéronautique*. DWB—Observations of visibility, cloud height and wind for the network of airways reporting stations in Belgium and Luxembourg are tabulated for each of 4 to 8 fixed hours, by class intervals. Surface temperature, pressure, wind, dew point and precipitation, sunshine and 850 mb, 700 mb and 500 mb temperature, dew point and wind are given graphically for the month. Frequency of occurrence of simultaneous visibility and ceiling height intervals, state of sea, visibility toward the sea and surface winds (direction and frequency of velocity groups) for several airports are also included. *Subject Headings:* 1. Airways climatic data 2. Monthly data bulletins 3. Belgium.—M.R.

5.1-45 551.506.1(71)

*Canada. Meteorological Division, *Monthly record [of] meteorological observations in Canada*. First issue received, Jan. 1940; last issue, Oct. 1950 (gaps in 1944). Toronto, pub. by the Div. entirely tables. Price: \$1.00 per year. DWB—This current monthly edition includes daily maximum and minimum temperature and daily precipitation records for all stations arranged by provinces and river basins, monthly summaries of the observations

of pressure, temperature, humidity, clouds, visibility and wind at fixed hours for selected stations, monthly summaries of the wind duration and mileage and frequency, as well as of bright sunshine, average for each hour. *Subject Headings:* 1. **Observational data** 2. **Monthly data bulletins** 3. **Canada.**—A.A.

5.1-46

551.506.1(994):551.591

*Falkland Islands and Dependencies. Meteorological Service, **Annual meteorological tables, 1951**. Prepared in conjunction with the Meteorological Office, London. [1952?] 38 p. mostly tables. Inserted: Amendments dated No. 1, 1952. DWB—Standard tables of data for Stanley (Falklands), Grytviken (S. Georgia), Signy Island (South Orkneys), Admiralty Bay and Deception Islands (S. Shetlands) and Argentine Island (Graham Land) in latitude 51° to 65°S are presented. Most of the data are for 8 fixed times a day. Wind speed forecasting tables by directions, visibility, low cloud amount and height, and frequency of hydrometeors are presented in extensive tables. (See item 4.1-43, Jan. 1953, *MAB* for annual report 1950.) *Subject Headings:* 1. **Annual meteorological reports** 2. **Ceiling and visibility data** 3. **Falkland Islands** 4. **Antarctic Ocean.**—M.R.

5.1-47

551.506.1(494):066

*[Switzerland. Meteorologische Zentralanstalt, **Annalen**. v. 86 and 87, 1949 and 1950.] 2 v. graphs, charts, tables, bibliog. DWB—Vol. 86: an elaborate compilation (and some analysis) of the twice daily observational data collected from all the 123 meteorological stations in Switzerland, with appendices consisting of separate articles on weather conditions during 1949, hailstorms, rainfall measurements from 294 stations, sunshine records, earthquake records, aerological data collected from daily radiosonde ascents at Payerne, and a detailed description of a hailstorm at Tessin on May 23, 1950. Also there is a good bibliography of works by Swiss meteorologists or about Switzerland written during 1949. The activities of the various branches of the service are also outlined. Vol. 87: The contents of this annual report for 1950 are as follows: a bibliography of Swiss meteorological and glaciological publications which appeared in Swiss and foreign publications during 1950; daily observations for the entire year at the stations Bern, Neuchâtel, Altdorf, Zurich, Chasseron, Bever, Léon, Lugano, Basel, Säntis and St. Gotthard; daily atmospheric temperature at the Jungfrauoch; daily maxima and minima and hourly means of atmospheric temperature for Zurich and Säntis; daily temperature extremes for 7 normal stations; monthly and annual means for all Swiss meteorological stations; a general survey of the weather during each month of 1950; monthly values of the most important meteorological elements at 9 stations; monthly and yearly totals of precipitation at all 1-3 order stations; results of precipitation totalizers set up in the Alps for the hydrological year 1949/1950 summarized by R. BOHMER; an analysis of the precipitation in 1912 by M. GRUTTER; monthly, annual and daily sunshine duration; discussion of the reduction of climatic mean values at Zurich to the new observation station of Kräbühlstrasse by H. UTTINGER and M. SCHÜEPP and a record of radiosonde observations at Payerne. *Subject Headings:* 1. **Annual meteorological reports** 2. **Observational data** 3. **Meteorological services** 4. **Switzerland.**—M.R., I.L.D.

5.1-48

551.506.1(649.1)

*Tenerife. Centro Meteorológico, **Boletín trimestral**. First issue received, v. 6, No. 61, Jan. 1950; last issue received, v. 8, No. 72, 1952. Publ. by the Centro, Santa Cruz de Tenerife. unpagged. tables, figs. DWB—This quarterly bulletin supercedes the monthly *Boletín Mensual Climatológico* (title varies; see item 3A-261, Jan. 1952, *MAB*) which was published from 1945 to 1949 in volumes 1 to 5 (consecutive Nos. 1-60). The quarterly version continues the numbering of the discontinued monthly, starting with v. 6, No. 61. It is a weather review giving a summary of weather development during the three months covered, and observational data from the three major stations on Tenerife Island and a number of cooperative stations on the islands of Tenerife, Palma, Gomera and Hierro. The data are on monthly mean or absolute values of pressure, humidity, insolation, wind, temperature, precipitation and other phenomena. A column of crop reports completes the publication. In some issues popular articles (dealing, for example, with the use of basic meteorological instruments) are included. *Subject Headings:* 1. **Observational data** 2. **Monthly climatic summaries** 3. **Tenerife, Canary Islands.**—G.T.

5.1-49

551.506.5(269,99):358.4:656.7

Norwegian-British-Swedish Antarctic Expedition 1949-50. Report by Officer commanding R.A.F. Antarctic flight. 113 p. numerous figs. Mimeo. **GB-MO**—Section 6 "Weather" (p. 35-37) gives a brief account of flying conditions from the base station in $70\frac{1}{2}^{\circ}\text{S}$ 10°W in Jan. and Feb. 1950. *Subject Headings:* 1. Antarctic expeditions 2. "Maudheim" expedition, 1949-50.—*C.E.P.B.*

PHENOLOGY

5.1-50

551.506.8

Mäde, Alfred, **Bemerkungen zur Vereinfachung des phänologischen Meldeprogramms.** Remarks on the simplification of the phenological information service.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 42:110-114, 1952. fig., 2 tables. **DWB**—Proposals for making phenological observations simpler and more representative are illustrated by dates of 12 subjects at Halle, 1894-1939 and statistical studies on them. *Subject Heading:* Phenology.—*C.E.P.B.*

5.1-51

551.506.8:591.543.4

Menges, Gustav, **Beginn und Ende des Winterschlafes unserer einheimischen Amphibien und Reptilien sowie die Zeiten der Lautäusserung unserer einheimischen Froschlurche in graphischen Darstellungen.** [Beginning and end of hibernation of our indigenous amphibia and reptiles and the times of croaking of our indigenous frogs shown graphically.] *Angewandte Meteorologie*, 1(8):241-244, Dec. 1952. 2 figs. **MH-BH**—List of mean dates of hibernation and of croaking in SE England and remarks on animal phenology. *Subject Heading:* 1 Animal phenology.—*C.E.P.B.*

5.1-52

551.506.8(438)

*Molga, Marian, **Czas trwania okresu wegetacyjnego w Polsce w 1948 r. na podstawie obserwacji fitofenologicznych.** [Length of the growing season in Poland in 1948 determined by means of phytophenological observations.] *Poland. Państwowy Instytut Hydrologiczno-Meteorologiczny, Prace*, No. 11, 1949. 80 p. 9 maps, mostly tables. In Polish, French summary p. 15. **DWB**—A voluminous collection of phenological data accompanied by detailed phenological charts of Poland for each separate event used as an indicator, and comments regarding the length of growing season and its determination for such data. The beginning of the growing season was obtained by taking the mean of the dates of flowering of 10 species, and the end of growing season as the mean date of changing colors and of falling leaves of the horse chestnut and beech. *Subject Headings:* 1. Phenological data 2. Growing season 3. Poland.—*M.R.*

5.1-53

551.506.8:633.1(82)

Pascale, Antonio J., **Mapa fenológica del trigo en la República Argentina.** [Phenological chart for wheat in Argentina.] *Meteoros*, 2(1/2):50-65, Jan./June, 1952. 4 figs., table, bibliog. p. 64-65. English summary p. 50. **DPA**—Isophenes of sowing, earing and harvesting of winter and spring wheat for 1947-1950 are presented on separate charts for the wheat growing region of Argentina. The history of phenological charts for agricultural crops is reviewed, methods of collecting data from the phenological network of the agrometeorological Dept. of the Servicio Meteorológico Nacional, and of compiling the data and charts discussed and conclusions for each variety listed. *Subject Headings:* 1. Phenological charts 2. Wheat phenology 3. Argentina.—*M.R.*

5.1-54

551.506.8(531/5):551.586:581.036

*Schneider, Max, **Summe, Mittel und mittlere Extreme der Temperatur von phänologischen Zeitspannen.** [Sum, mean and mean extreme of temperature in phenological intervals.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 42:276-281, 1952. 3 figs., tables, 3 refs. **DWB**—Values are given for 11 stations in S. Germany for: beginning of apple blossom to beginning of winter rye flowering; the latter to winter rye harvest;—to corn harvest; during corn harvest. Relations to flowering times in different years are close enough to warrant forecasts. *Subject Headings:* 1. Phenological data 2. Germany.—*C.E.P.B.*

INSTRUMENT CARRIERS

See also: **High altitude research** (Burgess), 5.1-4.

5.1-55

551.507.33

Vere-Jones, N. W., **A low-pressure hydrogen generator.** *New Zealand. Dept. of Scientific and Industrial Research. Dominion Laboratory, Information Circular, No. 53, Sept. 1951.* 5 p. 3 figs., 3 refs. **DWB**—Apparatus for the production of up to 100 cubic feet of hydrogen suitable for filling meteorological balloons, is described. The hydrogen is produced by the action of caustic soda on scrap aluminium turnings. The rate of the reaction is controlled by the rate of addition of water. Pressure greater than 1 lb/sq. in. cannot develop. Production costs, excluding freight and labor, are just over half that of bottled hydrogen at the factory. The apparatus described was manufactured in New Zealand in 1951 for under £50. Eighteen months experience in the use of the apparatus at Nandi, Fiji, has proved it to be generally satisfactory. Minor modifications will be incorporated in succeeding models. Ferro-silicon may be used instead of aluminium in the same apparatus, though the reaction is more erratic. **Subject Headings: 1. Hydrogen generators 2. Balloons.—Author's abstract.**

5.1-56

551.507.362:551.515.53

Singer, S. Fred, **De dampkring onderzocht met vuurpijlovoertuigen; in de toekomst onderzoeken vault een kustmatige maan?** [The atmosphere explored by means of rocket flights; will investigations be made in the future on an artificial moon?] *Hemel en Dampkring* 50(10):161-171, 1952. 4 photos. **DLC**—Space travel and the investigation of the uppermost atmosphere utilize rocket flights in their investigations and the possibility exists of establishing an artificial moon equipped with astrophysical instruments. Rockets can provide data on the physical and chemical properties of the uppermost reaches of the atmosphere including radiation, the properties of the meteorological variables, aerodynamic phenomena and nuclear reactions. Some V-2 rocket flights carried out in the U. S. are described and the findings on the upper atmosphere resulting from them are summarized. Photographs of aerobee rocket and a diagram showing the types of instruments and their arrangement in an aerobee rocket are reproduced. **Subject Headings: 1. Upper atmosphere research 2. Rocket instrumentation 3. Rocket research.—I.L.D.**

5.1-57

551.507.362:535.33

Tousey, R. (*Naval Res. Lab., Wash., D. C.*), **Rocket spectroscopy.** *Optical Society of America, Journal*, 43(4):245-251, April 1953. 15 figs., refs. **DWB**—The results of studies of the solar spectrum made from rockets and extending from the ultraviolet to soft X-rays are reviewed. Experiments with spectrographs have given the solar intensity distribution to 2000Å, the Fraunhofer spectrum to 2300Å with varying resolution reaching 0.6Å above 2630Å, and the magnesium doublet at 2800Å with intense emission cores. The vertical distribution of ozone was determined to 70 km and found to be in agreement with a photochemical calculation. Diurnal heating in the ozone layer was calculated. The intensity of Lyman alpha of hydrogen, 1216Å, was measured with photon counters and with a thermoluminescent phosphor, and solar X-rays from 5-7Å were observed by these methods and also by direct photography through filters. The absorption of X-rays was found to occur in the E layer and must account, at least in part, for its production. **Subject Headings: 1. Spectroscopy 2. Rocket research.—Author's abstract.**

INSTRUMENTS

See also: **Use of unfiltered light in determining particle radius . . .** (Kerker, Hampton), 5.1-24; **Instrumental problems in atmos. analysis** (Washburn, Austin), 5.1-110; **Rocket-borne instrumentation . . .** (Jackson), 5.1-115; **Short period temp. variation measurements with Assmann aspiration psychrometer** (Heckert), 5.1-171; **Rainfall studies with rain gage and radar** (Hudson, Stout, Huff), 5.1-231; **Soil moisture measurement** (Kubo), 5.1-256.

5.1-58

551.508.26:656.7

Austin, D. C., **The performance of various types of resistance thermometers for outside air temperature measurements from aircraft.** *Farnborough, England. Royal Aircraft Es-*

shipment, *Technical Note*, No. EL.28, April 1952. 14 p. 4 figs., tables, 5 eqs. Mimeo. E. Ref: EL/G530-1/DCA/31. GB-MO—Sources of error in aircraft thermometer systems discussed. Velocity error is expressed as $K(V/100)^2$, where K is less than 1. Mountings nickel and 3 platinum thermometers and flight test procedure are described and values of pound for each thermometer. An exposed platinum bulb on the nose gave best $K(0.87)$ error $\pm 1^\circ\text{C}$ but for practical reasons other types are preferred. *Subject Headings: 1. Thermometry 2. Air-borne thermometers.*—C.E.P.B.

5.1-59

551.508.26:536.5

Borgars, S. J., A meniscus thermometer for the measurement of small temperature differentials, particularly at low temperature. Farnborough, England. Royal Aircraft Establishment, R.A.E. Ref: Radio/MDO5/SJB/171, May 1952. 12 p. fig., 2 refs., eqs. Mimeo. GB-MO—A thin-walled glass bulb is attached to a horizontal glass capillary tube containing very short column of liquid (silicon oil); construction and calibration described. *Subject Headings: 1. Thermometers.*—C.E.P.B.

5.1-60

551.508.26(02)

Canada. Meteorological Division, The bimetal thermograph. Canada. Meteorological Division, Circular 2270, Ins. 49, Instrument Manual 21, April 14, 1953. 6 p. fig. Price: 25 cents. DWB—Practical instructions are given for the operation of the bimetallic thermographs in use at stations of the Canadian Met. Div. The instructions include a description and illustration of the instrument and details of installation, maintenance, handling and adjustment. The thermograph may be used for continuous records at meteorological stations or in remote locations. An ordinary thermometer, which is usually more accurate, should be used as a standard to correct thermograph errors. *Subject Headings: 1. Thermographs 2. Instrument manuals.*—G.T.

5.1-61

551.508.26

Jehn, Kenneth H., Wet bulb temperatures without a wick. Texas. University. Electrical Engineering Research Laboratory, Contract N6onr-266, Task Order II, NR 082 055, Report No. 20, Sept. 1, 1948. 32 p. 15 figs., 18 refs. Also in: *Review of Scientific Instruments*, 19(9):668-673, Sept. 1949. DWB—It is desired to determine the feasibility of measuring wet bulb temperatures without a wick. The sensing element is a thermistor bead of small mass and rapid response, which, when dipped into distilled water, retains water in sufficient quantity to register a wet bulb temperature when exposed to the air. The experimental apparatus and procedures are described in detail, and the data presented. It is concluded that wickless wet bulb measurements are feasible, with an accuracy of the order of $\pm 0.1^\circ\text{C}$. *Subject Headings: 1. Thermistors 2. Temperature measurement. I. Texas. University. Electrical Engineering Research Laboratory II. Contract N6onr-266, Task Order II, NR 082 055.*—Author's abstract.

5.1-62

551.508.765:551.571

Vonnegut, Bernard, A capillary collector for measuring the deposition of water drops on a surface moving through clouds. *Review of Scientific Instruments*, 20(2):110-114, Feb. 1949. 8 figs., refs., 5 eqs. DLC—Describes the capillary collector, successfully test flown several times in a B-17 airplane, and still in operation at M.I.T., Weather Radar Group. Data from one flight demonstrate the collection efficiency (=a function of the size of the collector, velocity, and the dropsize) in evaluating the liquid content of the atmosphere. With slight modifications this collector can be used for measurements of other liquid aerosols. *Subject Headings: 1. Capillary collectors 2. Water vapor measurement.*—W.N.

5.1-63

551.508.769:551.576.31

Jones, H. Spencer (Sussex, Eng.), Cloudiness in relation to choice of astronomical sites. *Nature*, 116(3021):572, Nov. 21, 1952. DWB—A brief note to the effect that a comparison between day and night cloudiness records made at Greenwich Observatory and at Herst-

monceux (the new location of the Greenwich Observatory), England, shows that there is more cloudiness in the daytime than at night, though the effect was more pronounced at Greenwich than at Herstmonceux, which is nearer the coast and hence less affected by diurnal cloud changes. The night observations were made by photographing trails of faint circumpolar stars. Even cirrus clouds affect these, whereas only denser clouds affect the bright star trails. *Subject Headings: 1. Night sky cloudiness recorders 2. Diurnal cloud variations 3. Astronomical sites 4. Greenwich Observatory, England.—M.R.*

5.1-64

551.508.77:551.508.8

Bergeiro Hargain, José Mariá, *A propósito del vecto-pluviómetro de orientación anemoscópica*. [An inclined rain gage with anemoscopic orientation.] *Revista Meteorológica* Montevideo, 11(41):246-248, April 1952. 2 figs. DWB—The apparatus described and illustrated in this note is the combination of two rain gages with opposite inclination. The instrument indicates rainfall amounts on a slope and on an assumed opposite slope. The gage is equipped with a wind vane for continuous windward orientation. *Subject Headings: 1. Rain gages 2. Anemoscopic rain gages.—G.T.*

5.1-65

551.508.77:551.594.11

Gerdel, R. W. (*SIPRE*), *Radioactive snow gage*. *Weatherwise*, 5(6):127-129, Dec. 1952. 5 figs. MH-BH—An instrument designed at the Central Sierra Snow Laboratory by the author and B. L. HANSEN, and further developed by Motorola, Inc., is described and illustrated. Its operation is based on gamma rays emitted by radioactive cobalt and received by a Geiger-Mueller tube connected with an electronic counter, the number of impulses received indicating the water equivalent of the snow cover under investigation. Calibration characteristics are discussed. The device is particularly useful inasmuch as it is capable of giving continuous readings of changes in snowpack at a single site. *Subject Heading: 1. Radioactive snow gages.—G.T.*

5.1-66

551.508.77:551.551(09)

Warnich, C. C., *Wind studies on shielded snow gages*. *Western Snow Conference, Proceedings, 17th Annual Meeting*, April 1949. p. 37-43. 8 figs., 3 refs. DWB—The first shielded gage is said to be that of JOSEPH HENRY (1853). The most universal shield was a trumpet shaped one devised by F. E. NIPHER (ca. 1878) but it is useful only for rain measurement. The Marvin (1908) and Alter (1937) shields are described. They do better for snow measurement than unshielded gages, but do not prevent "bridging." A laboratory study of smoke (air) movements around gages with several shapes of shields, and the field testing of several storage gages near Mullan Pass, Idaho (6000 ft) are described, and illustrations show results of smoke wind tunnel experiments on models. The ring type shield proved least subject to turbulence. *Subject Headings: 1. Shielded snow gages 2. Wind effects.—M.R.*

5.1-67

551.508.79:551.574.42

Howell, Wallace E., *Comparison of three multicylinder icing meters and critique of multicylinder method*. U. S. NACA, *Technical Note*, 2708, June 1952. 40 p. 9 figs., 6 tables. DLC—Three multicylinder icing meters, fundamentally similar but differing from each other in important design details, were compared in use at the Mount Washington Observatory. Comparison of relative effectiveness of the instruments, evaluation of observational errors, determination of the effects of detailed design differences, and recommendations for further improvements of design are presented. An evaluation of the multicylinder method, concerned with the validity of the theoretical basis and the degree to which the instruments and the technique of their use permit accurate determinations of the physical measurements involved, is also included. *Subject Headings: 1. Icing meters 2. Instrument comparisons.—Author's abstract.*

5.1-68

551.508.8:664.8

Haenni & Cie (*Jegenstorf, Switzerland*), *Appareils de mesure de la pression, de la température, de l'humidité pour la boucherie*. [Apparatus for the measurement of pressure, temperature and humidity in meat packing plants.] *Les Nouvelles de Haenni, Jegenstorf*,

36, Nov./Dec. 1951. 8 p. photos, diagrs., graphs. **Le thermo-hygrographe Haenni, 508, au service de Pentomologie medicale.** [The Haenni hygrothermograph type 508 in medical entomology.] *Ibid.*, No. 39, May/June 1952. 4 p. 7 figs. DWB—1) A number of instruments are used for recording and control of temperatures in refrigerators for serving and storing meat. These are described and illustrated. 2) A special use of a hygrothermograph mentioned in the first paper is reported by R. GEIGY who found it to be very satisfactory in micrometeorological measurements. These measurements were made in the Alps during a Swiss expedition which investigated temperature and humidity conditions in regard to the breeding of disease-propagating insects. Photographs of the instrument and the tropical sites in which it was operated are presented. *Subject Headings:* 1. Hygrothermographs 2. Refrigeration 3. Recording equipment. I. Geigy, R.—G.T., M.R.

5.1-69 551.508.8:551.586
Manig, Marianne, **Versuche mit einem Taschen-Thermohygrographen.** [Investigations on a pocket hygrothermograph.] *Germany. Deutscher Wetterdienst in der US-Zone, Mittheilungen*, No. 38:339-342, 1952. 6 figs., 2 refs. DWB—A small recording hygrothermograph used to explore the layer between the skin and the outer clothes. A number of records reproduced. It is found that in general temperature and relative humidity change in the same direction, due to the heat regulating mechanism of the body. *Subject Headings:* 1. Hygrothermographs 2. Bioclimatic research.—C.E.P.B.

5.1-70 551.508.822:621.315
Nagel, J. F., **A new telemetering device for measuring instruments.** *Weather*, 8(8):227-230, Aug. 1953. 3 figs., 6 refs. MH-BH—A motor driven apparatus, termed "a rheostat which turns eccentrically," is described which makes successive contacts with pointers of measuring instruments. Wiring diagram and specimen temperature chart from a radiosonde are included. Instrument was developed by South African Weather Bureau for a new type of radiosonde. *Subject Headings:* 1. Distant recording equipment 2. Radiosondes. E.P.B.

5.1-71 551.508.822
Nyberg, Alf, **On the comparison of radiosonde data in Payerne, May 1950.** *Swedish Meteorologiska och Hydrologiska Institut, Meddelanden, Ser. B*, No. 9, 1952. 22 p. 8 tables, 11 refs., eqs. Price: Kr. 2:50. DWB—A detailed statistical study of the data obtained at Payerne during May 1950, when six types of radiosondes were compared by means of simultaneous flights. The systematic differences (due to fog and radiation effects) are shown and examined from the point of view of upper air synoptic analysis as well as for meteorological accuracy. Systematic differences as high as 17 mb, 1.8°C, and 60 m in pressure, temperature and height (200 mb) were found, and the mean standard deviation at 500 mb for sounding was 6 mb, 0.6°C and 18 m respectively, with errors increasing with height. Scatter of data is shown graphically and in tables. If one type of instrument gives consistent results even if systematically biased, corrections can be applied and this should always be done where possible. *Subject Headings:* 1. Radiosonde errors 2. Instrument comparisons Payerne, Switzerland.—M.R.

5.1-72 551.508.822
*U. S. Weather Bureau, **Radiosonde compatibility tests; made at Oklahoma City, Oklahoma, June 4-20, 1951.** Wash., D. C., March 1952. 273 p. 21 figs., charts, 12 tables. B—Details and data from tests, including test procedure (personnel, types of equipment, and installations and log of tests), possible sources of error and comments on individual tests. Most of the volume is devoted to actual data, presented both in tables and on adiabatic diagrams. Tests were conducted under the sponsorship of the ACC-Met ad Hoc Group Analysis of the Compatibility of Radiosondes, to see if significant differences existed in instruments used by U. S. Weather Bureau, Air Force and Navy. Conclusion as usual was that not enough data was collected to draw conclusions. *Subject Headings:* 1. Instrument comparisons 2. Radiosondes.—M.R.

5.1-73

551.508.822:551.515.4(55)

Venkiteswaran, S. P. and Tilakan, A. R. B. (Met. Off., Poona), **Interesting features shown by a radiosonde ascent at Poona on April 1950, during a thunderstorm.** *Indian Journal of Meteorology and Geophysics*, Delhi, 3(1):55-59, Jan. 1952. 3 figs., 2 refs. **DLC**—The variations of pressure and temperature with time experienced by the radiosonde and the rate of rotation of the fan operating the radiometeorograph are shown on graphs; the tephigram obtained from the ascent giving the distribution of dry and wet bulb temperatures, and a table giving the approximate rates of ascent or descent of the radiosonde balloon in the different phases are presented. The movement of the balloon in the thunderstorm during the various phases and the tephigram for ascent are analyzed. The up and down currents are observable mainly near the boundary of the warm air mass below and the cold air mass above, and the currents extend from about 750 mb to 650 mb. *Subject Headings*: 1. Radiosonde ascent 2. Tephigrams 3. Thunderstorms 4. Poona, India.—*I.L.D.*

SYNOPTIC ANALYSIS AND FORECASTING

See also: Baroclinic model of atmos. applied to numerical forecasting (Arnason), 5.1-120.

5.1-74

551.509:681.17

Eliassen, Arnt, **Bedre varvarsler?** [Better forecasts?] *Naturen*, 76(10):301-312, 1955 2 figs. **DLC**—Deals with developments in weather forecasting. Using the combined tools of data on the movement of cyclones and anticyclones, synoptic charts, simplified models and extrapolation, fairly reliable 1 to 1½ day forecasts can be made. The numerical method, with electronic computers, may improve forecasts of 3-4 days. When it becomes possible to calculate atmospheric factors such as friction and heat supply, the forecasts may be extended to 4-5 days, a time period for which the analog method may prove valuable. The one month forecasts of the U. S. Weather Bureau show that statistical methods and the punched card system afford encouraging prospects in weather forecasting. *Subject Headings*: 1. Weather forecasting 2. Punched card methods 3. Long range forecasting.—*W.N.*

5.1-75

551.509:551.4

Ivanov, I. V., **Obsuzhdenie na Sovete Tsentral'nogo instituta prognozov uchebnykh posobiia "Predskazanie morskikh gidrologicheskikh kharakteristik"** (rukopis' K. I. Kudriavoi). [Discussion at the Soviet Central Forecasting Institute on the instruction manual "Forecasting marine hydrological characteristics" (manuscript of K. I. Kudriavai).] *Meteorologiya i Gidrologiya*, No. 4:52, Dec. 1950. **DLC**—The book was severely criticized at a special session on October 10, 1950. The publishing of the book was postponed and the author was invited to revise the manuscript to conform to the remarks and observations expressed during the discussion. *Subject Headings*: 1. Seminars 2. Marine forecasting 3. Textbooks 4. Kudriavai, K. I.—*A.M.P.*

5.1-76

551.509:06(71)

McTaggart-Cowan, P. D. (Asst. Controller, Canadian Met. Service, Toronto), **The Canadian experiment.** *American Meteorological Society, Bulletin*, 34(2):51-53, Feb. 1953. **MH-BH**—In a rebuttal to BERGERON's article "Ways of improving the weather service" (see item 3.5-8, May 1952, *MAB*), the author takes the stand that meteorologists can be proud of their achievements in improving forecasts, training meteorologists and making local forecast studies, and goes on to relate specific progress in Canada which refutes the criticism of BERGERON, e.g.: 1) specialized service to industry at Hamilton, Ont.; 2) assignment of trained Weather Service meteorologists to other agencies (Forest Service, Agriculture Experiment Stations, Aerial Surveying and National Research Council); 3) support for Defence and Military Services and 4) improvement in trans-oceanic forecasts for aviation. *Subject Headings*: 1. Forecast improvement 2. Forecast services 3. Canadian weather service. **I. Bergeron, Tor.-M.R.**

5.1-77 551.509(04)
 Pfeiffer, John, **Something doing about the weather.** *New York Times Magazine*, July 13, 1952. p. 18-19. illus. DWB—General principles of weather forecasting are explained and new techniques used in collecting and evaluating data are described. Among the features discussed are electronic computers (particularly "Maniac" developed by DR. JOHN VON NEUMANN, Princeton), storm prediction from microseisms and storm detection by radar and radiosondes. Two photographs are presented, one showing lightning strokes and the other an Air Force observation station in Greenland. *Subject Headings: 1. Popular meteorology 2. Weather forecasting.*—G.T.

5.1-78 551.509:37(02)
 U. S. Navy. Fleet Weather Central, **Some recent developments in synoptic meteorology.** Washington: U. S. Navy, 1952. 13 sections, separately paged. refs., illus. DWB—A manual compiled from various sources to use for reference and instruction in training Naval Reserve Aerologists at Norfolk, Va. The contents include excerpts from papers by H. RIEHL on forecasting in mid-latitudes; by J. J. GEORGE on forecasting cyclone movement in the eastern U.S.A.; by WOLFF and HAGGARD on use of the Pastogram in pressure-height computation; by DUTHIE and HALTINER on estimating height of constant pressure surfaces; by WOBUS on CAVT tables (constant absolute vorticity trajectories) used in map analysis; by WOLFF on blocking patterns at 500 mb level; by HALTINER on verification by use of skill score; and by HARDING on rules for typhoon forecasting. Other aids in analysis and forecasting are included. *Subject Headings: 1. Training manuals 2. Forecast aids. I. U. S. Bureau of Aeronautics (Navy). Project AROWA.*—M.R.

5.1-79 551.509(02):656.7
 Zweng, Charles Alfonso and Zweng, Allan C., **Airline transport pilot rating.** North Hollywood, Calif., Pan American Navigation Service, 1950. 423 p. photos, tables, diagrs., charts. DWB—Chapters 12 through 16 (p. 175-270) contain a thorough treatment of meteorological elements for pilots and navigators operating on international airlines. Air masses, fronts, thunderstorms, winds, fog and ice are discussed in detail with explanatory tables, charts, curves, cloud photos, etc. Particular attention is given to symbols used on weather charts and in teletype sequence reports. Special weather forecasts used in flight planning are explained and examples given. A list of 101 questions about meteorology used in pilot rating examinations is found on p. 395-400 and 411-414. A sample "daily weather map" as used by the U. S. Weather Bureau is attached and symbols listed. *Subject Headings: 1. Aerological meteorology 2. Airways forecasting 3. Textbooks. I. Pan American Navigation Service.*—G.T.

5.1-80 551.509.1:629.13
 Engelbrecht, S. A. (*Palmietfontein*), **Report on a familiarization flight.** *South Africa. Weather Bureau, News Letter*, No. 35:5, Feb. 29, 1952. DWB—Discussion of weather, communications and forecast dissemination in flight from Palmietfontein to Lourenço Marques and return. Delays in transmission of forecasts and weather information were main complaints. *Subject Headings: 1. Training flights 2. Forecast dissemination 3. South Africa Lourenço Marques, Mozambique.*—M.R.

5.1-81 551.509.1
 *France. Service Hydrographique de la Marine, **Radiosignaux à l'usage des navigateurs. 2, Météorologie.** [Radio signals for the use of navigators, v. 2, Meteorology.] Paris, Imprimerie Nationale, Jan. 1, 1952. 187 p. tables, forms, 9 maps (fold.). *France. Service Hydrographique de la Marine, Ouvrage, No. 2A. Addendum, mettant l'Ouvrage 2A à jour à la date du 1er Juin 1952.* [Addendum, bringing Radio Signals for the use of navigators up to June 1, 1952.] [1952] 21 p. table, form (fold. laid in). DWB—Gives details of International Meteorological Codes (SYNOP, SHIP, AVB, AERO, analysis, national codes of France, the Soviet Union), radiosonde codes, ship reporting system and in the appendix an English-French glossary of simple meteorological terms. The handbook also contains extensive lists of stations broadcast, and types and times of broadcasts from each country and

radio station, with material included in each broadcast. *Subject Headings:* 1. Marine meteorological code, 1949 2. Marine meteorological observations.—*M.R.*

5.1-82

551.509.1:551.555

U. S. Air Weather Service, **Upper wind code.** *U. S. Air Weather Service, Manual*, 105-211 July 1, 1952. 22 p. forms. DWB—Codes used by the U. S. Air Weather Service are based on WMO Code adopted at I.M.O. meeting in Washington Oct. 1947 and effective Jan. 1, 1949. This manual gives details of levels to be reported, coding of each individual element in each group, coding missing observations or data, coding correction and examples of reports and from continental U.S.A. and from outside continental U.S.A. in English and metric units respectively. Appended are details of WMO codes for winds aloft (land, ship, nephoscope), a list of block numbers for the whole earth and regional variations in coding upper wind reports. *Subject Headings:* 1. International meteorological codes, 1949 2. Upper air wind codes.—*M.R.*

5.1-83

551.509.1:551.506.7 (02)

U. S. Weather Bureau, **Radiosonde and rawinsonde code in international form as adopted by the International Meteorological Organization at Paris in 1946 and revised at Washington in 1947.** 1949 ed. Washington, 1950. 34 p. forms. DLC—The forms and specifications of the IMO Radiosonde and Rawinsonde Code are given in detail for U. S. Weather Bureau observers and analysts. Some revisions, made in Toronto in 1947, are incorporated in this manual. *Subject Headings:* 1. International meteorological codes, 1949 2. Radiosonde codes 3. Code specifications 4. Manuals.—*M.R.*

5.1-84

551.509.1:551.501.1 (02)

U. S. Weather Bureau, **Synoptic code, 1949 edition.** Effective 0030 GCT, January 1, 1949 Washington, D. C., Pub. by the Bureau, Nov. 1948. 81 p. tables, forms. DLC—Instructions for coding and decoding synoptic reports at the U. S. Weather Bureau stations are given in detail, based on the International Synoptic Code adopted after much work in Washington, D. C. in Oct. 1947 and made effective Jan. 1, 1949 in most countries. Amendments to and interpretations of the code, based on later decisions of the CSWI or of its Code Subcommissions, are appended. Useful conversion tables are included along with the extensive code specifications for each element of each code group. *Subject Headings:* 1. International meteorological codes, 1949 2. Code specifications 3. I.M.O. Synoptic code, 1949 4. Manuals.—*M.R.*

5.1-85

551.509.31:681.144

Bilancini, Raoul, **Le calcolatrici elettroniche e la previsione del tempo.** [Electronic computers and weather forecasting.] *Rivista di Meteorologia Aeronautica*, 12(4):62-63, Oct./Dec. 1952. MH-BH—General principles of the use of electronic computers for forecasting purposes are outlined. Following announcements made in the *Scientific American* No. 2, 1952, two electronic computers are briefly described. These computers, smaller but more efficient than previous models, were developed at the Institute for Advanced Studies, Princeton and at the Scientific Laboratory, Los Alamos. *Subject Headings:* 1. Electronic computers 2. Forecasting techniques.—*G.T.*

5.1-86

551.509.5:551.575

Gringorten, Irving I. (Geophysics Res. Directorate, Air Force Cambridge Research Center, Mass.), **An objective system for estimating fog and stratus probability at Randolph Field, Texas.** *American Meteorological Society, Bulletin*, 34(2):63-67, Feb. 1953. 4 figs., 3 tables, 13 refs. DWB—In a competition between the Air Weather Service forecasting at Randolph Field and the objective forecasting personnel of the Geophysics Research Directorate of the Air Force Cambridge Research Center both terms averaged 78% accuracy in forecasting fog and stratus during the winter season of 1949-50. Average frequency of low ceilings, advancing maritime air, pressure gradient and mean dew point from 1939 to 1949 show a gradual rise, whereas there has been a similar fall in the frequency of polar outbreaks. An objective aid involves linear regression between days with on-shore pressure gradient and moisture over the Gulf of Mexico and probability of fog and stratus. A test of 13 years of

ta gives an expected number of accurate forecasts between 70% and 86% of total. *Subject Headings*: 1. Objective forecasting 2. Fog forecasting 3. Stratus forecasting 4. Statistical forecasting 5. Randolph Field, Tex.—*M.R.*

5.1-87

551.509.5:551.515.8(71)

*Hage, K. D., Investigation of forecast issued by the Dominion Public Weather Office at Edmonton for Calgary and Lethbridge, June 18, 1951. *Canada. Meteorological Div., Circular* 16, Tec. 115; Experience Report, No. 14, June 3, 1952. 11 p. 8 charts, ref. DWB—discusses a completely unexpected passage of an active cold front. The slightest disturbance may result in extensive lines of thunderstorms and showers by later afternoon due to surface heating. Author proposes frontal contour analysis up to the tropopause on a 12-hour basis during the summer months. *Subject Headings*: 1. Frontal analysis 2. Thunderstorm forecasting 3. Forecast errors 4. Canada.—*A.A.*

5.1-88

551.509.5:551.515.4

Numata, T. and Miyake, H., Thunderstorm forecasting in Tohoku District. *Journal of Meteorological Research*, Tokyo, 4(5):172-178, Aug. 1952. 5 figs., table. In Japanese, English summary p. (13). MH-BH—A practical method of thunderstorm forecasting in Tohoku district is analyzed. (1) Relation between pressure pattern and thunderstorm occurrence probability is shown. (2) The difference of equivalent potential temperature between 700 mb and 1000 mb is used as an index of convective instability. (3) The temperature difference at 850 mb between Akita and Sendai may be used for thunderstorm forecasting. (4) Relation between thunderstorm occurrence probability and winds aloft is clarified. (5) Strong thunderstorms occur before cold front passage. *Subject Headings*: 1. Thunderstorm forecasting 2. Upper air temperature variations 3. Tohoku District, Japan.—*Authors' abstract.*

5.1-89

551.509.5:551.515.4

*Oertel, Albert G., Objective method of forecasting thunderstorms in the Fire Weather District of Northern California during July and August. May, 1952. 20+3 p. 4 tables, 6 figs., 6 charts (fold.). DWB—Four years of 500 mb charts and thunderstorm data (1948-51) were used to prepare the scatter diagrams and one year (1947) as a independent test. The parameters selected (from a dozen or more) as giving the best correlation were 500 mb height differences between Las Vegas and Brownsville and between Las Vegas and 50°N, 145°W in the NE Pacific) and 500 mb temperature at Santa Maria and Oakland, sources of air, cold fronts, moisture content (no correlation) and many other factors were studied, and the charts and scattergrams presented. Skill scores for July and Aug. are given in detail, and appear encouraging—especially for Aug. Verification figures of 1952 season are appended, showing high skill score for objective method and even higher for actual forecasts combining objective method and experience. *Subject Headings*: 1. Thunderstorm forecasting 2. Objective forecasting 3. Fire weather forecasting 4. Northern California.—*M.R.*

5.1-90

551.509.5

American Meteorological Society. District of Columbia Branch, Panel discussion on forecast verification. *American Meteorological Society, Bulletin*, 33(7):274-278, Sept. 1952. MH-BH—Various points of view on the goals, principles and procedures of forecast verification were discussed at this forum. G. W. BRIER analyzed the purposes of forecast verification from the economic, administrative and scientific aspects. The verification of forecasts by means of quality control was stressed by C. P. MOOK and various aspects of scoring were discussed by I. GRINGORTEN. Comments from participants from the floor are included. *Subject Headings*: 1. Forecast verification. I. Brier, Glenn Wilson II. Mook, C. P. III. Gringorten, Irving I.—*I.L.D.*

5.1-91

551.509.5:551.558.21

Scorer, R. S., Forecasting mountain and lee waves. *Meteorological Magazine*, London, 2(974):232-234, Aug. 1953. fig., ref. MH-BH—A forecasting diagram of wave length is

given for $1/Ul$, where U is wind in knots across mountain ridge and $l^2 = g\beta/U^2 - U''/U$, in terms of thickness of 100 mb layer and potential temperature difference. *Subject Heading:* 1. Lee wave forecasting.—C.E.P.B.

ARTIFICIAL PRECIPITATION

5.1-92

551.509.67

American Meteorological Society, *Statement on weather modification*. May 1, 1953. 2 p. Issued on Society letterhead. Mimeog. DWB—Seeding of supercooled clouds with dry ice and injection of small water drops or salt particles in the base of nonsupercooled cumulus clouds can initiate certain modifications within the cloud and sometimes trigger the release of precipitation. Poorer results are obtained with silver iodide. Statistical analyses have not shown a significant increase of precipitation by ground-based silver iodide seeding. Large scale weather modifications by cloud seeding are not proved. *Subject Headings:* 1. Weather modification 2. Cloud seeding.—A.A.

5.1-93

551.509.67(794)

§*Battle, John A.; Jones, W. Floyd and Todd, Clement, *Cloud-seeding experiments in the San Diego County and the Santa Ana River Watershed*, Nov. 1, 1951 through April 15, 1952. Rev. ed. June 10, 1952. [Pub. by Santa Ana River Weather Corporation.] 142 p. 88 figs., 7 plates, tables, ref. p. 2. Also: *Supplement*, Nov. 1, 1951, through April 15, 1952. (Rev. ed.) Oct. 1, 1952. 7 p. tables, map. DWB—Statistical tests showed that about 20% more rain fell in the target area seeded by silver iodide particles than in a control zone. Chance of error 1:12 to 1:10,000. Statistical analysis explained, actual data and scatter diagrams given. Synoptic analysis of 2 single storms made, using tropospheric winds (2000 to 18,000 ft), as well as ascent data. *Subject Headings:* 1. Cloud seeding experiments 2. Synoptic studies 3. San Diego County, Calif. 4. Santa Ana River, Calif. I. San Diego County Weather Corporation II. Santa Ana River Weather Corporation.—A.A.

5.1-94

551.509.67

Beaumont, R. T., *An analysis of cloud-seeding operations in North Central Oregon. Oregon. Agricultural Experiment Station, Corvallis, Circular of Information*, No. 503, Oct. 1951. 5 p. 2 figs. DWB—Cloud seeding by a silver iodide ground generator operated from Sept. 1950 to June 1951 during actual or probable storm conditions. Although 8 out of 10 months showed positive departures from precipitation amounts estimated statistically by means of control area, there was no definite evidence of a positive effect of the seeding operations. *Subject Headings:* 1. Cloud seeding evaluation 2. Oregon.—A.A.

5.1-95

551.509.67

Blair, Richard, *Control of the weather*. *Discovery*, London, 13(4):113-114, April 1952. photo. DLC—In connection with recent weather control activities, the author discusses the effect of an increase or decrease in rainfall on the economic welfare of various regions throughout the world. He declares that while increasing precipitation would be vital for many regions, the reverse is the case for other areas. Guano production, the reduction of insects and diseases, the cultivation of certain fruits and crops and the tourist trade call for diminished rainfall. A photograph showing South African scientists at work with a silver iodide generator is added. *Subject Heading:* 1. Weather control.—G.T.

5.1-96

551.509.67(794)

Hall, Ferguson; Henderson, T. J. and Cundiff, Stuart A., *Cloud seeding in the Sierra near Bishop, California*. *American Meteorological Society, Bulletin*, 34(3):111-116, March 1953. 9 figs. DWB—A critical analysis of results of cloud seeding operations by dry ice carried out by the California Electric Power Co. in the High Sierras near Bishop, Calif. Runoff for the three years (1948-50) from the watershed into Bishop Creek compared with runoff from nearby watersheds not affected by the seeded clouds, and with runoff for other years (1926-47 and 1917-47). Also the runoff for the 3 years when seeding was conducted is compared with what would be expected from snow survey measurements in the area. Only the

1948 and 1949 runoff was significantly greater in the seeded area, though the average for the 3 years was significant at 5% level; and a 9% increase in flow was indicated for the 3 years with 90% confidence limits between 0 and 18%. The outstanding 1949 values could have been due to 1949 having unusual circulation patterns affecting the immediate area. Less runoff actually occurred than would have been expected from prior snowpack. *Subject Headings: 1. Cloud seeding effectiveness 2. Bishop, Calif.—M.R.*

5.1-97

551.509.67:551.577.1 (729.1)

*Howell, Wallace E., Associates, Inc., Cambridge, Mass., **Summary evaluation of cloud seeding operations in Cuba, 1952.** April 1953. 19 p. 7 figs., 5 maps, refs. MH-BH—Effects of cloud seeding operations conducted in five sugar plantations in Cuba are statistically analyzed. Using data from the target and control areas and normals for those areas, regression equations, correlation coefficients, standard errors and probability ratios are computed. Results of the analysis are presented in charts and graphs. The author finds a significant increase of rainfall over the target areas and shows that the probability of such an increase under natural conditions is as small as 1:2,000. *Subject Headings: 1. Cloud seeding effectiveness 2. Precipitation distribution 3. Statistical analysis of artificial rainfall 4. Cuba.—G.T.*

5.1-98

551.509.67:6

North American Weather Consultants, Pasadena, Calif., **Report on cloud seeding operations in the southern Cascades, Nov. 1951–April 1952.** Prepared for California Oregon Power Company. *North American Weather Consultants, Pasadena, Calif., Report, 6–8, Sept. 1952.* 37 p. 18 figs., numerous tables, 18 refs. DWB—This report covers the operation and evaluation of results of a cloud seeding program directed toward increasing snow pack in the Southern Cascades during the 1951–52 winter season. In this report appear discussions of: the physical processes of natural and artificially induced precipitation processes (sections 3 and 4); the instrumentation of the cloud seeding program (section 5); a summary of weather events during the program (section 6); and an evaluation of results (sections 7 and 8). It is concluded that during the 1951–52 season, cloud seeding increased snow pack in the target area by 33% above what could be expected on the basis of comparison with an historically related area to the north. Runoff appears to have been raised by about 25%. It is recommended that essentially the same seeding plan be followed for another year. *Subject Headings: 1. Cloud seeding effectiveness 2. Cascade Mountains.—Author's abstract.*

5.1-99

551.509.67 (569.4)

Rosenan, Naftali (*Israel Met. Service*), **Climatological analysis of cloud seeding experiments during the second year of the experimental period, 1951/2, in Israel.** Hakirya Ministry of Agriculture, Div. of Research, Rainfall Research Committee, Dec. 1952. 6 p. ref., map.—Twenty seven cloud seeding experiments carried out by means of a silver iodide smoke generator on the ground. Various statistical tests were made which show some evidence that experiments were successful. *Subject Headings: 1. Cloud seeding effectiveness 2. Israel. I. Israel. Rainfall Research Committee.—A.A.*

5.1-100

551.509.67

†*Terada, Kazuhiko (*Dir. Nagasaki Marine Obs.*) et al., **On the artificial stimulation of rain in the Kyusyu area.** *Oceanography and Meteorology*, Nagasaki, Japan, 6(1):19–88, 1952/53. graphs, diagrs., tables, plates, bibliog. p. 38–39. In Japanese, English summary p. 79–88. MH-BH—The first part deals with artificial production of rime, the second gives a detailed report on experimental stimulation of rain. Dry ice, 1.5 kg each time, was introduced into the atmosphere by balloon and released in a fixed layer. The probable path of the balloon was traced by means of all available aerological information. Precipitation measured in the area of the path indicates that the experiment was rather successful, although it is impossible to determine whether reported meteorological changes were artificial or natural. *Subject Headings: 1. Artificial precipitation 2. Cloud seeding 3. Rime 4. Kyusyu, Japan.—A.A.*

5.1-101

551.509.67

U. S. Dept. of the Interior. Committee for the Evaluation of Bonneville Power Administration Cloud-Seeding Operations in the United States Portion of the Pend Oreille River Basin, **Report**. Pub. by the Dept., July 1952. 94 p. 28 figs., 4 illus., maps, graphs, 15 refs. **DWB**—Statistical material related to the cloud seeding activities in western Montana, northern Idaho and the northeastern corner of Washington is presented and analyzed. In these experiments six AgI generators were operated from Sept. 21 to Sept. 30, 1951 for a total of 286 generator hours. The statistical study is based on precipitation and runoff data for the operation period which are compared with long period mean values. Probabilities of occurrence and significance of the results obtained are determined. Although some positive effect could be observed, the Committee states that more extensive material would be necessary in order to reach final conclusions. A paper by VINCENT J. SCHAEFER on "The use of silver iodide particles for seeding supercooled clouds" is incorporated into the report. *Subject Headings*: 1. Statistical analysis of artificial precipitation 2. Cloud seeding with silver iodide 3. Northwestern United States. I. Schaefer, V. J.—G.T.

STRUCTURE AND PHYSICS OF THE ATMOSPHERE

STRUCTURE OF THE ATMOSPHERE—IONOSPHERE

See also: Air pollution, 5.1-9; Planetary upper air frontal zone (Zubian), 5.1-156; Explanation of brightness of color of sky (Hulburt), 5.1-158; Ebb and flow of oceans, atmos. and earth (Defant), 5.1-188; Theory of turbulent diffusion in atmos. (Ogura), 5.1-193; Study of ionospheric winds and turbulence by long radio waves (Millman), 5.1-206; Nitrogen content in precip., Sweden (Ångström, Högberg), 5.1-234; Opacity and atmos. impurities (Miura), 5.1-299; Polarization measurements of low frequency echoes (Kilpatrick), 5.1-312.

5.1-102

551.510.4:551.1

Landsberg, Helmut E., **The origin of the atmosphere**. *Scientific American*, 189(2): 82-86, Aug. 1953. diags. **DWB**—Present composition of the earth's atmosphere is described. Escape velocities for different gases under various temperatures are discussed and the evolution of the atmosphere is deduced from changes in the escape of atmospheric constituents due to the cooling of the earth. Four hypothetical stages of the atmosphere are described and illustrated by colored schematic diagrams. Three hypotheses on the origin of oxygen (by thermal dissociation, photochemical dissociation or photosynthesis of carbon dioxide in plants) are mentioned and the presence of argon is explained. The atmosphere of Mars, which appears to represent a later stage of development, is suggested as a possible clue for predictions regarding future evolution of the terrestrial atmosphere. The effect of human, especially industrial activities and its compensation by nature is considered. *Subject Headings*: 1. Origin of atmosphere 2. Atmospheric evolution 3. Atmospheric composition.—G.T.

5.1-103

551.510.41:551.577:016

†Eriksson, Erik (*Royal Agri. Col. of Sweden, Uppsala*), **Composition of atmospheric precipitation. II. Sulfur, chloride, iodine compounds**. *Bibliography. Tellus*, 4(4):280-303, Nov. 1952. 11 figs., 14 tables, bibliog. p. 296-303. **MH-BH**—On the basis of a comprehensive and critical review of the literature (317 references are cited), the author discusses the combined sulfur content of the atmosphere and its annual variation; the origin of combined sulfur in the atmosphere; the annual and geographical variations of chloride in precipitation; the origin of chloride in precipitation; the meteorological factors influencing the chloride content of rainwater such as amount of rainfall, wind direction and wind strength and altitude; the Köhler distribution of chloride concentration in white frost formed at high altitudes by precipitation and freezing of supercooled water particles in clouds; the practical importance of the transport of oceanic salt inland; and the iodine content of precipitation and of air. *Subject Headings*: 1. Precipitation composition 2. Sulfur content of air 3. Chloride content of air 4. Iodine content of air 5. Bibliographies.—I.L.D.

5.1-104

551.510.41:546.214

*Hinzpeter, Hans, *Ergebnisse der in den Jahren 1941-1945 in Potsdam durchgeführten Ozonmessungen*. [Results of ozone measurements carried out at Potsdam, 1941-1945.] Germany. Deutsche Demokratische Republik. Meteorologischer und Hydrologischer Dienst, Veröffentlichungen, No. 9, 1952. 22 p. mostly tables, 3 refs. DWB—One of the few systematic measurement series. Instrument: ozone spectrometer according to DOBSON. Intensity measurements in 3110 and 3300 Å or 4450 Å; ratio depends on ozone content. Data given for ozone content reduced to normal temperature and pressure together with solar height, path of solar rays through atmosphere and ozone layer, as well as state of sky and visibility during measurement. *Subject Headings*: 1. Ozone data 2. Potsdam, Germany. —A.A.

5.1-105

551.510.42:551.510.52

*Junge, Christian, *Die Rolle der Aerosole und der gasförmigen Beimengungen der Luft im Spurenstoffhaushalt der Troposphäre*. [The role of aerosols and gaseous impurities of the atmosphere in the chemical balance of the troposphere.] *Tellus*, 5(1):1-26, Feb. 1953. 18 figs., 9 tables, bibliog. p. 26. MH-BH—The size distribution curves for aerosols in the atmosphere at Frankfurt a.M. and Feldberg/Ts (800m) are extended to the ranges 0.005 to 0.1 μ radius on the basis of ion measurements at Frankfurt and Zugspitze, respectively. The maximum frequency occurs at about 0.08 μ. From these measurements the total volume of impurities in a given volume of air near the ground is calculated according to categories: Aitken, large and giant nuclei, respectively. The relative importance of the Aitken particles (.005 to .1 μ) is small compared with that of the 0.1 to 1 μ (large) or the 1.0 to 20 μ (giant) particles (the latter 2 size distributions contribute about equal volumes). The results of WOODCOCK on the spectrum of sea salt particles in sea air over the coast of New England agree very well with those obtained by sedimentation methods at Frankfurt. The effect of vertically changing Austausch (A) on particle count is illustrated for 5 different time intervals and 3 values of A. The effect is completely negligible at a height of 100 m but is quite pronounced at heights up to 25 m. Finally, an extensive summary is given of recent results of the author, W. JACOBI and W. LIPPERT (see item 4.4-185, April 1953, MAB) in chemical analysis of natural aerosols by determining the dispersion of electrons. Smaller nuclei (<1 μ) are mostly ammonium sulfate, whereas NaCl nuclei are generally >1 μ. Electron microscope determinations and, finally, results of chemical analysis of rainwater are discussed and tabulated along with results of other authors in various parts of the world. *Subject Headings*: 1. Aerosol content of atmosphere 2. Condensation nuclei spectrum 3. Chemical analysis of aerosols 4. Rain composition 5. Frankfurt a.M., Germany.—M.R.

5.1-106

551.510.41:546.214

Long, Arthur R. (U. S. W. B., Montgomery, Ala.), *Discussion on atmospheric ozone*. Alabama Academy of Science, Birmingham, Journal, 23/24:145-149, Feb. 1953. 16 refs. Abstracted from reprint. DWB—A review of current knowledge on atmospheric ozone wherein the author describes its chemical and photochemical properties and its variations in space and time. Day-to-day and annual variations of ozone are found to be more markedly related to weather conditions than to solar activity. *Subject Headings*: 1. Ozone 2. Ozone variations. —G.T.

5.1-107

551.510.41:546.214

Teichert, F., *Bericht über Ozonmessversuche mit Fluoreszein*. [Report of attempts of measuring ozone with fluorescein.] *Zeitschrift für Meteorologie*, 7(2):33-34, Feb. 1953. 6 refs. WB—Report of unsuccessful attempts made in a laboratory with artificially ozonized oxygen. Apparatus and methods used are described. The method is not recommended for quantitative measurements of ozone in the lower layers of the atmosphere. *Subject Headings*: 1. Ozone measurement techniques 2. Laboratory experiments 3. Fluorescein.—A.A.

5.1-108

551.510.42

Baynton, H. W., *The role of meteorology in the Detroit-Windsor air pollution study*. Royal Meteorological Society, Canadian Branch, [Publications], 4(4), 1953. 9 p. fig., refs.

DWB—A nontechnical description of the project for study of the amount of air pollution and its effects on health, vegetation, etc. in the Detroit, Mich.—Windsor, Ontario area. The pollution is caused by steamboats operating in internationally controlled waters. Hence the investigation was set up by the International Joint Commission under a Technical Advisory Board on Air Pollution, with a U. S. section and a Canadian section. The details of studies on wind, turbulence, diffusion, lapse rate and precipitation factors affecting pollution in the area are outlined. Lapse rate, or stability, is considered the most crucial meteorological factor.

Subject Headings: 1. Atmospheric pollution studies 2. Lapse rates 3. Detroit-Windsor area.—*M.R.*

5.1-109

551.510.42

*Clayton, George D.; Giever, Paul M.; Sitgreaves, Rosedith; Brinton, Hugh P. and Gafafer, William, **Report of results of sampling the atmosphere in the Detroit River area during 1951.** International Joint Commission, Technical Advisory Board on Air Pollution, U. S. Section, March 1, 1953. 55 p. 46 figs., 24 tables+tables in appends., 14 refs. **DWB**—The extensive report covers the history and terms of reference of the International Joint Commission and its Technical Advisory Board on Air Pollution, and the details of investigations conducted on the U. S. side of the International Waterway during 1951. Air sampling areas and instruments used for sampling are described, and extensive data collected on nature and amounts of contaminants given in tables. *Subject Headings:* 1. Atmospheric pollution studies 2. Atmospheric pollution data 3. Detroit, Michigan. I. International Joint Commission. Technical Advisory Board on Air Pollution. U. S. Section.—*M.R.*

5.1-110

551.510.42:551.508.91

Washburn, Harold W. and Austin, Robert R., **Some instrumentation problems in the analysis of the atmosphere.** *National Air Pollution Symposium, Stanford, Calif., Nov. 10-11, 1949. Proceedings*, p. 69-76. 3 figs., 3 tables, 4 refs. **DWB**—A discussion of two instrumental analytical methods for determining the kind and amount of contaminants in the atmosphere. These are: 1) the use of Titrilog which records continuously the amount of bromine required to titrate samples of polluted air containing sulphur dioxide, which can be detected in a concentration of 20 parts per million and 2) the use of the mass spectrometer to identify the types of contaminants. *Subject Headings:* 1. Atmospheric pollution 2. Air sampling and analysis 3. Titrilog 4. Symposia.—*I.L.D.*

5.11-111

551.510.534

*Ramathan, K. R. and Kulkarni, R. N. (*Phys. Res. Lab., Ahmedabad*), **Height distribution of atmospheric ozone.** *Indian Academy of Sciences, Proceedings, Sec. A*, Bangalore, 37(2):321-331, Feb. 1953. 4 figs., 2 tables, 12 refs. **DLC**—Results of observations of height distribution of ozone made at Mt. Abu, North India with a Dobson spectrophotometer from Oct. 1951 to April 1952. Ozone is negligible below 18 km, quite variable from 18-27 km and steady above 27 km. Compared with data at Delhi, Kodaikanal, White Sands, N. Mex., Arosa and Tromsø it is evident that ozone extends to lower levels at high latitudes. Ozone increases greatly with latitude, and is probably destroyed by water vapor carried upward by convection. As it is formed by photochemical dissociation of O_3 by sunlight, it is also wanting in the polar night. There is a high negative correlation with the height of tropopause. In subsidence areas (cold sinks) O_3 may be very great for long periods, just above inversion layer. *Subject Heading:* 1. Ozone distribution.—*M.R.*

5.1-112

551.510.534:551.524.7

Vassy, E. and Vassy, A., **Température moyenne de l'ozone atmosphérique.** [Mean temperature of atmospheric ozone.] *Indian Academy of Sciences, Proceedings, Sec. A*, Bangalore, 37(2):195-203, Feb. 1953. 2 figs., 19 refs., 6 eqs. **DLC**—It is shown how the spectroscopic determination of ozone temperature in the stratosphere would make possible the regular observation of the mean temperature of the atmosphere up to 70 km or so, rather than to 30 km as can be done with radiosondes; also the determination of the daily, seasonal, annual and regional variations in temperature of the high atmosphere would be possible; more data are needed on the amount (depth) of ozone in the ozone layer. Laboratory spectroscopy of

one by the authors has enabled them to define ozone temperature (1936) and to make observations at several places in France and the Alps (Mt. Blanc, Jungfrauoch, etc.) since 1935. *Subject Headings:* 1. Ozone spectroscopy 2. Ozonosphere temperature measurement 3. Alps.—*M.R.*

5.1-113

551.510.535

Al'pert, I. A. L., *Statisticheskii kharakter struktury ionosfery*. [Statistical nature of the ionospheric structure.] *Uspekhi Fizicheskikh Nauk*, Moscow, 44(1):49-91, Jan. 1953. 1 fig., 3 tables, 25 refs., 104 eqs. **DLC**—An extensive "survey article" reviewing in logical sequence the characteristics of the ionosphere as determined through statistical analysis of radio propagation data. The various layers of the ionosphere from which reflections occur during quiet periods are shown to be connected with the primary, secondary and tertiary reflections of signals (beautifully illustrated by a recorder record). The diffuse, complex and disturbed nature of the ionospheric layers at certain times makes a complicated statistical study necessary to formulate a theory or model of the ionospheric structure and behavior. The measurement of ionospheric drift is taken up in the final paragraph. The author shows good knowledge of the literature both native and foreign (3/5 of the references cited are from foreign sources). *Subject Headings:* 1. Ionospheric structure 2. Electromagnetic wave propagation 3. Survey articles.—*M.R.*

5.1-114

551.510.535

Hulburt, Edward O. (*Naval Res. Lab., Wash., D. C.*), *Physical characteristics of the upper atmosphere of the earth*. (In: *U. S. School of Aviation Medicine, Randolph Field, Texas, Physics and medicine of the upper atmosphere*. Albuquerque, 1952. p. 35-53. 1 fig., 4 tables, 22 refs.) **DLC**—The physical and chemical properties of the upper atmosphere above 80 km above sea level are reviewed. The topics covered are as follows: pressure, density and temperature from rocket experiments, winds in the upper atmosphere as determined by sounding balloons, smoke shells and meteor trails, the composition of the atmosphere, the ultraviolet spectrum and soft X-rays, atmospheric ozone, the light of the night sky, and the atmosphere above 200 km. Tables giving values of pressure, density and temperature up to 219 km, wind velocities deduced from meteor trails and ozone concentration up to 70 km above New Mexico are presented. *Subject Headings:* 1. Upper atmosphere physics 2. Upper atmosphere soundings.—*I.L.D.*

5.1-115

551.510.535:551.507.362

Jackson, John E. (*Naval Res. Lab., Wash., D. C.*), *Rocket-borne instrumentation for ionosphere propagation experiments*. *U. S. Naval Research Laboratory, Upper Atmosphere Research Report*, No. 13, Jan. 9, 1952. 39 p. 22+ figs., table, 15 eqs. *U. S. Naval Research Laboratory, Report* 3909. **DWB**—The rocket-borne equipment used for the ionosphere propagation experiments conducted during V-2 and Viking flights has been developed and improved to the extent that satisfactory operation has been obtained in all recent flights. Various problems were encountered in the development owing to the limitations imposed by the research vehicle and the method of experimentation. Space and weight, as well as freedom from interference with other cooperating agencies, has to be considered. In addition, the equipment has to be physically rugged and electrically stable to operate successfully under the several conditions of vibration, aerodynamic drag, and temperature changes occurring during flights. The experiments were conducted by transmitting two crystal-controlled c-w radio-frequency signals, one of such frequency as to be substantially affected by the ionosphere and the other of such frequency as to be essentially unaffected. Thus, since the antenna pattern has to be favorable toward the receiving stations on the ground, a diplexing whip antenna having a pattern similar to that of dipole has replaced the earlier V-2 tail antennas. In recent flights, experiments were begun 80 seconds after take-off at an altitude of approximately 35 miles. Autotune circuits were added to accomplish tuning, i.e., matching between transmitter and antenna impedances, at this time, and a retuning unit was developed to initiate second tuning at a much higher altitude. Antenna impedances during flight could be determined from the telemetering data of the micromatch circuit and of the matching transformer variable condenser position. The problems connected with ionosphere research

instrumentation are no longer considered major sources of difficulty; certain aspects of the antenna problem which still remain to be solved tend to reduce radiation efficiency, but apparently do not introduce serious errors in the propagation data provided that the rocket does not spin or tumble. *Subject Headings:* 1. Ionospheric research 2. Rocket instrumentation 3. V-2 rockets 4. Martin Viking rockets.—*Author's abstract.*

5.1-116

551.510.535:551.594.5:550.385

Martyn, D. F., The morphology of the ionospheric variations associated with magnetic disturbance. I. Variations at moderately low latitudes. *Royal Society of London, Proceedings Ser. A*, 218(1132):1-18, June 9, 1953. 8 figs., 16 refs. 9 eqs. **DLC**—Variations in height and density of ionosphere, especially F2, are compared with magnetic data for Watheroo, Canberra and Washington. In addition to diurnal variations (local time) are storm variations persisting for about 3 days after commencement of storm. Initial shape depends on local time of commencement. Ionospheric disturbances are attributed to an electrostatic field developed in auroral zone and spread through ionosphere by a drift of ionization. *Subject Headings:* 1. Ionospheric variations 2. Magnetic disturbances 3. Auroras.—*C.E.P.B.*

5.1-117

551.510.533

Utah. University, Physical properties of the upper atmosphere. Contract W19-122-ac-15, Progress Reports, Nos. 1-10, June 30, 1948-Dec. 5, 1951. 10 pieces. diagrs., graphs eqs. **DWB**—Description of construction, theory and performance of a 16 level step-voltage generator, and a theoretical and experimental analysis of dispersive networks. A helical delay line possessing inductive dispersion was constructed and delays were measured. Developmental investigations of antennas for installation in tail fin of V-2 rocket, and receiving antenna for ground installation were carried out. Further development on tests of antenna transmitters, circuits and cameras are indicated and illustrated in last two reports. *Subject Headings:* 1. Rocket research 2. Electromagnetic wave dispersion 3. Recording equipment I. Sinford, Leon B. II. Collins, T. Kirkwood III. Contract W19-122-ac-15.—*M.R.*

5.1-118

551.510.535:550.385:551.521.2

van Sabben, D., Relationship between radio-propagation disturbance, geomagnetic activity and solar noise. *Journal of Atmospheric and Terrestrial Physics*, 3(4):194-199, May 1953. 3 figs. **DWB**—A radio-propagation disturbance index *I* is derived and its variations in circuit New York-Amsterdam compared with variations of geomagnetic *K*. Close agreement is found, *I* having a mean lag of 7 hrs behind *K*. A nonrecurrent magnetic storm was generally preceded by an increased flux of radio noise, average interval 2 days. *Subject Headings:* 1. Ionospheric disturbances 2. Magnetic disturbances 3. Solar radio noise.—*C.E.P.B.*

5.1-119

551.510.535:523.78

Wells, H. W. (Carnegie Inst. of Washington, D. C.), Ionospheric effects of solar eclipse at sunrise, September 1, 1951. *Journal of Geophysical Research*, 57(2):291-304, June 1952. 9 figs., 6 refs., 3 eqs. **MH-BH**—Ionospheric observations at three stations in Maryland and Virginia during annular eclipse of Sept. 1, 1951 did not show significant increases of ion production. They indicate that coronal radiation is not an important factor in production of F2 ionization. *Subject Headings:* 1. Ionospheric variations 2. Solar eclipses 3. Maryland 4. Virginia.—*C.E.P.B.*

MECHANICS AND THERMODYNAMICS OF THE ATMOSPHERE

See also: Physical Review index, 5.1-7; Convective phenomena near heated surface (Ramdas), 5.1-8; Radiative transfer in far infrared bands (Elsasser, King), 5.1-165.

5.1-120

551.511:551.509.312

Arnason, G. (Univ. of Stockholm), A baroclinic model of the atmosphere applicable to the problem of numerical forecasting in three dimensions. I. *Tellus*, 4(4):356-373, Nov. 1952. 6 figs., 7 tables, refs. **DWB**—The author develops a three-dimensional baroclinic model of the atmosphere which is determined by four parameters, three of which specify the

ld of temperature. This model allows for a nonuniform temperature lapse rate in the horizontal and takes into account the observed division of the atmosphere into a troposphere and stratosphere. The number of parameters is reduced to three by utilizing the fact that the horizontal temperature gradient is usually reversed when traversing the tropopause. This model is used to integrate the vorticity equation along the vertical and the coefficients of the resulting two-dimensional equation are discussed. Examination of the coefficients indicates that in middle latitudes the level of mean wind may vary from 2.5–6.5 km and that the level of nondivergence is always higher than the former. On the average, the level of mean wind is below and the level of nondivergence above the 500 mb surface. The consequence of this for numerical forecasting are discussed. *Subject Headings:* 1. Numerical forecasting 2. Atmospheric models.—*From author's abstract.*

5.1-121

551.511:533:546.291

Azpiroz Yoldi, Miguel, *Sobre la fórmula de Knudsen*. [On Knudsen's formula.] *Revista de Geofísica*, 11 (42):154–156, April/June 1952. 7 refs., 3 eqs. MH-BH—A brief article giving an application of DE DONDER's (1936) theory of affinity to KNUDSEN's formula used in studying the properties of He II. *Subject Headings:* 1. Thermodynamics of gases 2. Helium. M.R.

5.1-122

551.511:551.571

Benton, George S., *Water vapor transport project*. Johns Hopkins University. Dept. Civil Engineering. Contract AF 19(122)-365, Quarterly Report, No. 4/5, June 12/Dec. 15, 1951, and Technical Report No. 2/3. 75 p. 2+2+20 figs., 6 tables, 2+11 refs. DWB—A comprehensive punched card project for the computation by line integration of divergence fields for water vapor transport over the U. S. and Canada. Technical Report No. 2 presents a valuable classification for the analysis of a field of motion and its division into mean motion, space eddy, time eddy, and space-time eddy components. The computation of eddy transport is shown. Technical Report No. 3 gives a detailed sample for the calculation of water vapor transfer (March 1949) for North America, Central United States and the Ohio River Basin. *Subject Headings:* 1. Water vapor transport 2. Large scale eddies 3. United States 4. North America. I. Johns Hopkins Univ. Dept. of Civil Engineering II. Contract AF 19(122)-365 III. Carnahan, Robert L. IV. La Seur, Noel E.—A.A.

5.1-123

551.511:551.515.8

Berliand, M. E. and Dobryshman, E. M., *Soveshchanie po voprosam issledovaniia informatsii vozdukh*. [Conference on the question of investigating the transformation of ...] *Meteorologiya i Gidrologiya*, No. 8:49–50, Aug. 1952. DLC—Review of meetings held at the Central Geophysical Observatory in cooperation with the Central Aerological Observatory, Central Institute of Weather Forecasting and Geophysical Observatories of Tashkent, Kiev and Minsk. The adiabatic air transformation (report by S. S. GAIGEROV), the transformation of cold air masses (by M. V. ZAVARINA), heat transformation of air masses (by M. E. BERLIAND) and actinometric investigations of free atmosphere (by V. G. ASTROV and E. A. LOPUKHINA) were discussed. Special reports on air transformation over the irrigated regions were made by P. A. VORONTSOV (aerological problem) and M. I. DIN (change of climate). *Subject Headings:* 1. Air masses 2. Energy transformation 3. Conferences.—N.T.Z.

5.1-124

551.511

Bugaev, V. A., *O poriadke velichin gorizontalnykh proizvodnykh baricheskogo i termaturnogo polei atmosfery*. [On the order of magnitude of horizontal derivatives of baric and temperature fields of the atmosphere.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geofiz.*, No. 4:86–97, 1952. 5 figs., 2 tables, 5 refs. DLC—Characteristic values for the horizontal first, second and third order derivatives in the 700 and 500 mb levels and for the relative topography 500/1000 mb are given for the evaluation of different terms in hydrodynamic equations. Table 1 (p. 88–89) presents averages and standard deviations on the basis of a statistical investigation (30 cases). Furthermore, the frequency of different radii of curvature is discussed. *Subject Headings:* 1. Dynamic meteorology 2. Pressure fields 3. Temperature fields.—A.A.

5.1-125

Diubiuk, A. F., *Primenenie metoda integrala Fur'e k opredeleniiu vetra po poli davleniia*. [Application of Fourier's analysis for wind determination along the pressure field.] *U.S.S.R. Tsentral'nyi Institut Prognozov, Trudy*, 15(42):48-62, 1949. 3 refs., 105 eqs. **DLC**—Equations of motion are integrated considering the surface friction in the form of GOLDBERG and MOHN, disregarding in the first approximation the convective terms of acceleration and using the Fourier integral for the solution of these linearized differential equations. In a second approximation, the convective terms are introduced. In the second part of this entirely mathematical discussion, the internal friction is considered using the method of multiple integrals for the solution. *Subject Headings*: 1. Wind field computation 2. Fourier analysis 3. Dynamics of the atmosphere.—A.A.

551.511

5.1-126

Garmendia Iraundegui, José, *Aplicaciones físicas de los solenoides y de las células triescalares*. [Physical applications of solenoids and of three dimensional cells.] *Revista de Geofísica*, Madrid, 11(43):219-251, July/Sept. 1952. diags., eqs. In Spanish, English summary p. 219. **DWB**—Generalizing Ertel's vorticity theorem for any vector A, the theory is expressed in several forms for all continuous media. The particular cases of irrotational movement, a continuous medium, with a fixed direction and in the solenoidal form are developed and applied to the theorems of THOMSON and V. BJERKNES and, finally, to the cases of a viscous fluid and to electrical, magnetic, sound and ray movement and to propagation of electromagnetic waves. The mainly mathematical treatment is amply supplemented by models and vector diagrams. *Subject Headings*: 1. Mechanics of the atmosphere 2. Ertel's vorticity theorem 3. Solenoids.—M.R.

5.1-127

551.511:551.555.11

Palmén, E. (*Academy of Finland*), *On the vertical eddy flux of momentum in the trade-wind zone*. *Indian Academy of Sciences, Proceedings, Sec. A*, Bangalore, 37(2):189-194, Feb. 1953. fig., table, 8 refs., 6 eqs. **DLC**—The meridional component v (u) corresponds to the cross-isobaric wind component, and the zonal component U to the component parallel to the isobars. The variation of the zonal component of the shear stress T_1 ($\tan \text{ sub } x$) with height is then determined by:

$$\rho \frac{du}{dt} = 2\omega \sin \phi \rho v + \frac{\partial T_x}{\partial z}.$$

The stress due to horizontal shear is neglected as it is only significant in large scale disturbances. H_1 denotes the level where there is no vertical eddy flux of momentum or the level of strongest east wind. H_2 is the level where the meridional component vanishes. In the model presented, H_1 is at 700 m and H_2 at 3000 m. Zonal stress at different heights 0-4 km at lat. 13°N in Jan. is given in table, as compiled from model at 700 mb (H_2) the shear stress is calculated as 1 dyne cm^{-2} . By a different method, the author computed the $20-30^\circ\text{N}$ stress at 700 mb as 0.5 dyne cm^{-2} or 1.2 that at 13°N . (See item 5.1-128 below.) *Subject Headings*: 1. Angular momentum flux 2. Meridional momentum flux 3. Shear stress over oceans 4. Trade wind models.—M.R.

5.1-128

551.511

Palmén, E. and Alaka, M. A. (*Univ. of Chicago*), *On the budget of angular momentum in the zone between equator and 30°N* . *Tellus*, 4(4):324-331, Nov. 1952. 3 figs., 3 tables, 11 refs. **MH-BH**—Using available empirical data for the month of Jan. the author calculates a complete budget of angular momentum for the zone $20-30^\circ\text{N}$. The budget is based upon a consideration of the following quantities in the belt $0-30^\circ\text{N}$; "(1) the horizontal and vertical flux of angular momentum due to the mean transport resulting from a mean meridional circulation, (2) the horizontal and eddy flux of angular momentum and (3) the angular momentum transfer from earth to atmosphere due to the surface stress of the wind." It is shown that the mean mass transport in the tropical circulation accumulates high relative momentum in the upper atmosphere of the $20-30^\circ\text{N}$ belt and the eddy transport distributes this momentum

upwards and downwards from the subtropical jet. *Subject Headings: 1. Angular momentum 2. Trade wind belt.—I.L.D.*

5.1-129

551.511:551.513

Platzman, George W. (*Univ. of Chicago*), **Starr's invariant**. *Tellus*, 4(4):352-355, Nov. 1952. 2 figs., 3 refs., eqs. **MH-BH**—A critical discussion of the article by STARR (Note on recent study of stability by R. Fjørtoft, *see item* 2.8-57, Aug. 1951, *MAB*) in which he pointed out that the integral "for two-dimensional flow of an inviscid incompressible fluid between parallel rigid walls (which coincide say with latitude circles) on a sphere is invariant." The author analyzes STARR's inference that "if vorticity distribution is monotone, so that ∂L [L —absolute vorticity] is everywhere positive or everywhere negative then zonal flow cannot develop into disturbed motion." *Subject Headings: 1. Dynamic stability 2. Zonal circulation.* Fjørtoft, R. II. Starr, Victor P.—*I.L.D.*

5.1-130

551.511

Van Mieghem, Jacques, **Comments on the vorticity equation**. *Indian Academy of Sciences, Proceedings, Sec. A*, Bangalore, 37(2):204-212, Feb. 1953. 8 refs., 10 eqs. **DLC**—In dealing with large values of absolute vorticity ($2 \times$ Coriolis parameter or more), it is considered necessary to make a distinction between individual and local changes in absolute vorticity. Using a moving system or curvilinear coordinates, analytical expressions are established for the rate of individual and of local changes of absolute vorticity which can be used in synoptic analysis. The most convenient form is considered to be the equation of balance of absolute vorticity (Van Mieghem, 1951) giving the local variations of absolute vorticity per unit volume in terms of vorticity flux and vorticity production. It is concluded that: 1) the local increase per unit area in the isentropic surfaces of the absolute vorticity X_n normal to these surfaces is equal to the convergence of the isentropic vorticity flux $X_n V_\theta - V_n \text{curl}_\theta V_1$ and 2) the local changes of the vertical component ζ of the absolute vorticity $\text{curl } V$ are due chiefly to the convergence or divergence of the horizontal vorticity flux $C_h \equiv \zeta V_h - W \text{curl}_h V$. *Subject Headings: 1. Absolute vorticity changes 2. Synoptic analysis.—M.R.*

GENERAL CIRCULATION

See also: Starr's invariant (Platzman), 5.1-129; *Dynamic climatology of Sicily* (Cicala), 5.1-295.

5.1-131

551.513:551.589.1

Borchert, John R. (*Univ. of Minnesota*), **Regional differences in the world atmospheric circulation**. *Association of American Geographers, Annals*, 43(1):14-26, March 1953. 6 figs., 5 refs. **DLC**—A "climatic boundary" is defined as "a zone across which a relatively large difference in the properties of the moving atmosphere is generated with relatively great frequency." World maps on which such zones are marked for Jan. and July are presented. They show major regional differences in prevailing winds and static climatic regions derived from these. *Subject Headings: 1. Air mass climatology 2. Circulation patterns.—G.T.*

5.1-132

551.513:551.557 551.587(53, 567)

Frost, R., **Upper air circulation in low latitudes in relation to certain climatological discontinuities**. *Great Britain. Meteorological Office, Professional Notes*, 7(107), 1953. 25 p., 6 figs., 6 tables, 25 refs. **M.O.** 524 g. **DWB**—Starting with a note by D. DEWAR (*item* 5.1-87, March 1952, *MAB*) about sudden changes of tropopause level and surface temperature in Iraq in May and Oct., the relations between jet stream and tropopause in the tropics are examined, with world charts of tropopause pressure and vector mean winds, and with vertical meridional sections and tephigrams. The mean zonal wind field is tabulated and related to mean zonal temperature field, and with time of onset of Indian monsoon. It is suggested that the sudden onset of the monsoon results from breakdown of lower tropopause barrier.

(For similar item see 3.7-87, July 1952, *MAB.*) *Subject Headings:* 1. Jet stream 2. Upper air climatology 3. Tropopause height 4. Tropics 5. Arabia 6. Iraq.—*C.E.P.B.*

5.1-133

551.513.1:551.543

*Jackson, S. P., *Atmospheric circulation over South Africa*. *South African Geographical Journal*, Johannesburg, 34:48-60, Dec. 1952. 2 figs., tables, 13 refs. *DWB*—The classical circulation schemes for South Africa for Jan. and July (BUCHAN, KENDREW, BROOKS and MIRRLEES) do not give the true picture of wind and pressure as actually prevails over the Plateau. The old scheme shows a mean anticyclone in July (winter) with strong outward blowing (monsoonal) winds and a mean cyclone in Jan. (summer) with inward blowing winds. Actual 2 km pressure charts and a consideration of wind direction and velocity frequencies for different times of the day, leads to charts of normal winds and pressures for 0800 and 1400, which are much the same in Jan. as in July (an asymmetrically oriented High with weak circulation and centered over the southeast coast). The disturbances which produce summer rains are not frequent enough to change the mean pressure pattern very much, and the reduction to sea level formula is largely responsible for the old model. *Subject Headings:* 1. Mean pressure charts 2. Plateau circulation schemes 3. Atmospheric circulation 4. South Africa.—*M.R.*

5.1-134

551.513.1

Sanders, R. A. (*U. S. W. B., Wash., D. C.*), *Blocking Highs over the eastern North Atlantic Ocean and Western Europe*. *Monthly Weather Review*, 81(3):67-73, March 1953. 14 figs., 11 refs. *MH-BH*—The concept of blocking is briefly reviewed and a definition of "blocking High" in terms applicable to the daily sea level weather map of the eastern North Atlantic Ocean is adopted. The monthly frequency and geographical distribution of blocking Highs as defined are determined from forty years of Historical Weather Maps and presented on charts. Several features of these distributions are discussed in relation to observed monthly weather variations. *Subject Headings:* 1. Blocking action 2. North Atlantic 3. Western Europe.—*Author's abstract.*

5.1-135

551.513.2:551.557

Bond, H. G., *Easterly jet streams over Darwin*. *Weather*, 8(8):252-253, Aug. 1953. 1 table. *MH-BH*—Note on jets of 80 knots from 80-110° at 48,000-58,000 ft in Jan. and Feb. 1953. *Subject Headings:* 1. Easterly jet stream 2. Australia.—*C.E.P.B.*

5.1-136

551.513.2

Mironovitch, Valéry, *Représentation de la circulation atmosphérique générale pour une coupe aérologique méridienne à travers les deux hémisphères*. [Representation of the general circulation of the atmosphere on a meridional cross section through both hemispheres.] *Académie des Sciences, Paris, Comptes Rendus*, 236(4):404-406, Jan. 26, 1953. 2 figs. *DWB*—Meridional cross sections up to 22 km along 50°W in the Northern and 150°W in the Southern Hemisphere for winter and summer separately show the height of the main isobars, the height of the tropopause and the isopleths of the zonal geostrophic wind, utilizing for the equatorial region direct observations of the wind. The tropopause has a discontinuity in the region of the jet stream. The tropical and equatorial tropopauses are distinguished. *Subject Headings:* 1. Meridional cross sections 2. Tropopause 3. Jet stream.—*A.A.*

5.1-137

551.513.2:551.557:551.576.1

Track jet streams by cloud formations. *Science News Letter*, 63(6):83-84, Feb. 7, 1953. *DLC*—Brief note on a report delivered (during a motion picture presentation) by DR. VINCENT J. SCHAEFER (G.E.) at the 1953 annual meeting of the American Meteorological Society in New York. Four basic cloud formations are identified as indicating the existence of a jet stream. These cloud types are peculiar cirrus streamers, high cirrocumulus, altocumulus and billowing altocumulus. A good photograph of billowing altocumulus is presented. *Subject Headings:* 1. Jet stream cloud formations 2. Cloud structure. I. Schaefer, Vincent J.—*G.T.*

ATMOSPHERIC DISTURBANCES

- See also: Exploration of atmos. by rockets (Singer), 5.1-56; Radiosonde ascent during thunderstorm (Venkiteshwaran, Tilakan), 5.1-73; Forecast investigation (Hage), 5.1-87; Thunderstorm forecasting, Tohoku District (Numata, Miyake), 5.1-88; Objective method of thunderstorm forecasting (Oertel), 5.1-89; Conference on transformation of air (Berliand, Dobryshman), 5.1-123; Low min. temp. June 12-13, W. U. S. (Hughes, Ross), 5.1-179; Orographic influence on atmos. pressure and currents (Suzuki), 5.1-187; Relation: jet stream and cyclone formation (Riehl), 5.1-208.
- 5.1-138 551.515.3(729.9)
Macky, W. A. (*Bermuda Met. Serv.*), **The Easter tornadoes at Bermuda.** *Weatherwise*, 7(4):74-75, June 1953. 2 figs. MH-BH—Description, photographs and map showing paths of tornadoes which crossed Bermuda on Easter Sunday, April 5, 1953 at 1800 to 1830 local time. One passed directly over Hamilton. Microbarograph trace shows a sharp dip of 8 mb and an equal rise in a very short period. The maximum wind was 89 m.p.h. at the meteorological office. Only 1 life was lost as most everyone was indoors and only 90 buildings were damaged. *Subject Headings: 1. Tornadoes 2. Bermuda.—M.R.*
- 5.1-139 551.515.3(76)
Newton, Charles H. (*U.S.W.B., Texarkana, Arkansas*), **Tornadoes at Texarkana.** *Weatherwise*, 5(5):98, 110, Oct. 1952. MH-BH—A first hand account of the three successive tornadoes that occurred on July 16, 1952. The damage caused by them and the weather associated with the onset of the tornadoes are described. *Subject Headings: 1. Tornadoes 2. Texarkana, Arkansas.—I.L.D.*
- 5.1-140 551.515.3(261)
Rodewald, Martin, **Beobachtung von zwei Wasserhosen.** [Observation of two waterspouts.] *Wetterlotse*, No. 58:137-139, June 1953. fig. DWB—Nov. 24, 1952, near Svinöy, a convergence cloud on a marked cold front (chart). *Subject Headings: 1. Waterspouts 2. North Atlantic.—C.E.P.B.*
- 5.1-141 551.515.3(78.4)
St. John, Francis, **Terror of the winds.** *The Courier*, London, Oct. 1948. p. 81-83. DWB—A vivid, illustrated account of the nature and damage caused by tornadoes in the U.S.A. and occasionally in NW Europe. *Subject Headings: 1. Tornadoes 2. Tornado damage 3. United States 4. Northwest Europe.—M.R.*
- 5.1-142 551.515.3
U. S. Weather Bureau, **It looks like a tornado . . . an aid for distinguishing tornadoes from other cloud forms.** Wash., D. C., U. S. Weather Bureau, March, 1953. 11 p. photos, 11 figs. Price: \$.10. DWB—A small, well illustrated pamphlet giving advice and schematic diagrams to illustrate how tornadoes form and how the layman can distinguish between a true tornado and several other phenomena (virga from a rain cloud, distant thunder shower, shelf type squall cloud, shelf type squall cloud, mammatus formation under a thundercloud, dust whirl or waterspout). Some actual tornadoes are described and illustrated. Prompt and accurate reporting of real tornadoes is said to be essential to protection of life and property. Numerous reports of other phenomena as being tornadoes, cause undue alarm or panic and confusion. *Subject Heading: 1. Tornado identification.—M.R.*
- 5.1-143 551.515.3(261)
Waterspout, North Atlantic Ocean. *Marine Observer*, 23(159):8, Jan. 1953. 2 figs. MH-BH—Brief account with sketches of waterspouts in 32°27'N, 43°20'W on March 8, 1952 and 25°30'N, 50°42'W on March 31, 1952. *Subject Headings: 1. Waterspouts 2. North Atlantic.—C.E.P.B.*
- 5.1-144 551.515.3(261/4)
Waterspout observed on route Cape Town to Barbados. *Indian Journal of Meteorology and Geophysics*, 3(1):40, 1952. fig. DWB—Sketch of waterspout observed on March 15, 1951. *Subject Headings: 1. Waterspouts 2. Atlantic Ocean.*

5.1-145

551.515.8:551.524.7

§Bradbury, Dorothy L. and Palmén, E. (*Chicago Univ.*), **On the existence of a polar-front at the 500-mb level.** *American Meteorological Society, Bulletin*, 34(2):56-62, Feb. 1953. 7 figs., 2 refs. **MH-BH**—A 500-mb Northern Hemisphere isotherm chart for Feb. 6, 1952 is presented to show the concentration of isotherms in a narrow belt meandering between 30° and 70°N around the hemisphere. This is shown to be definite proof of a frontal surface at the 500-mb level—a phenomenon which analysts 10-15 years ago refused to consider at all, and which even today many analysts are reluctant to enter on upper level charts. Soundings and reconnaissance flights over the oceans and in the vicinity of the frontal zone bear out the sharpness of the front at 500-mb, the relation it bears to the jet stream and the tropopause, and its role in cyclogenesis. Hence, it is considered to be a useful forecast tool. *Subject Headings*: 1. Polar fronts 2. Upper air fronts 3. Jet stream 4. Upper air temperatures 5. Northern Hemisphere.—*M.R.*

5.1-146

551.515.8(47)

§Dubentsov, V. R., **Letniaia transformatsiia vozdukhnykh mass nad kontinentom.** [Summer transformation of air masses over the continent.] *U.S.S.R. Tsentral'nyi Institut Prognozov, Trudy*, 17(44):3-63, 1949. 25 figs., 25 tables, 27 refs. **DLC**—The author analyzed the process of warming up over European U.S.S.R. and Middle Asia of air masses incoming from Polar regions and Atlantic. Basic factors of the transformation are investigated in detail. It was found that temperature of Arctic air masses rises 3-4°C per day in lower layers during first 3-4 days; the warming process continues 6-7 days. Rise of temperatures for cold air masses incoming from west is not so intensive and is only 2°C per day, and intensity increases only when these masses reach southeastern Russia and Middle Asia. Thermal lapse rate in atmospheric layer from 1 up to 5 km usually during the warming process is increased from 0.4-0.5°C up to 0.6-0.7°C and stable mass at first becomes unstable. The analyses of many cases of invasions for the period 1936-1946 show that over European Russia and Middle Asia during summer the process of transformation of cold air mass into mass of warm continental air (which is incorrectly called tropical air) predominated. *Subject Headings*: 1. Air mass transformation 2. Middle Asia 3. U.S.S.R.—*N.T.Z.*

5.1-147

551.515.8:551.515.4(45)

§Gazzola, Adriano, **Temporali frontali sull'Italia Nord-Occidentale.** [Frontal thunderstorms over northwest Italy.] *Rivista di Meteorologia Aeronautica*, 12(3):3-17, July/Sept. 1952. 9 figs., 6 refs. French, English and German summaries p. 3. **MH-BH**—A study of the synoptic situations which produced thunderstorm conditions in northwest Italy between April and Sept. 1951. A particularly detailed analysis is made of the situation on June 23, 1951, by means of surface and 700 mb charts for Europe and a frontal analysis for northwest Italy and the Alps for each 2-hour period from 1200 to 1800 on June 23; and a similar treatment (though more simple) for a situation on Aug. 26, 1879 (analyzed by E. PINT). The geographical distribution of frontal thunderstorms in the summer of 1951 is shown graphically for the region and discussed. *Subject Headings*: 1. Frontal thunderstorms 2. Synoptic studies 3. Northwest Italy.—*M.R.*

5.1-148

551.515.8(267)

Jalu, Raymond and Viaut, André, **La circulation générale dans le sud-Ouest de l'Océan Indien méridional.** [The general circulation in the Southwest Indian Ocean.] *Académie des Sciences, Paris, Comptes Rendus*, 235(17):968-971, Oct. 27, 1952. **DWB**—Polar fronts in the Antarctic part of the West Indian Ocean (near Kerguelen) are similar in structure to the Arctic polar fronts but of shorter period (18 to 36 h) and of more rapid eastward displacement (60 to 80 km/h) even in summer. Very rapid changes take place in the strong cyclogenetic region around the Crozet Islands. Effects of meridional circulation, of convergence of ocean currents and of the preferred path for outbreaks of Antarctic continental air near the coast of Enderby Land are discussed. Most formations in summer of 1949-50 were simple cold fronts with open warm sector; no evidence of occlusions or of N-S oriented cold fronts was found. Effects on subtropics noted. *Subject Headings*: 1. Atmospheric circulation 2. Antarctic fronts 3. Cyclogenesis 4. Southwest Indian Ocean 5. Kerguelen, Island.—*M.R.*

5.1-149 551.515.8(52)
 Kinoshita, Masatoki, **On the cold front over the neighborhood of Nagasaki** (2nd and 3rd report). *Oceanography and Meteorology*, Nagasaki, 5(1/2; 3/4):36-38; 67-69, June; Dec. 1951. 13 figs., 8 refs. In Japanese; English summaries p. 38; 69. DWB—The mechanism of the gust which accompanies cold fronts (and the warm air preceding them) on their passage over the Nagasaki area in winter is investigated. Land-sea temperature differences west of the Tsushima Strait, accentuated by the warm Tsushima ocean current, and orographic effects in northern Honshu are suggested as primary factors in the development of gustiness. The analysis is completed by schematic diagrams and sample charts. *Subject Headings*: 1. Cold fronts 2. Orographic effects 3. Nagasaki, Japan.—G.T.

5.1-150 551.515.8(47):551.577
 Mishutin, D. A., "Sukhie" atmosferynye fronty v iuzhnykh stepiakh Ukrainy. ["Dry" atmospheric fronts in the southern steppes of the Ukraine.] *Meteorologiya i Gidrologiya*, Moscow, 6:35-36, 1952. ref. DLC—The frequency of cases when the fronts passed over the territory without precipitation was statistically investigated. It was found that in about 45% of cases the movement of fronts (cold, warm and occluded) was not accompanied by precipitation. This phenomenon is more frequently observed during Aug. (up to 75% cases were precipitation free). The author suggested that increasing irrigation and water surfaces can create an impulse which will transform these "dry" fronts into normal ones. *Subject Headings*: 1. Frontal type precipitation 2. Southern Ukraine, U.S.S.R.—N.T.Z.

5.1-151 551.515.8(548)
 Ramakrishnan, K. P. and Ganapathiraman, G. V. (*Met. Office, Poona*), **Squalls in Madras**. *Indian Journal of Meteorology and Geophysics*, 4(1):103-104, Jan. 1953. table. MH-BH—An advance note on the results of studies of squalls at Madras based on anemograms for two years (Madras Harbor and Nungambakkam Observatory). Squalls occur about 25 days a year and mostly in the season May-Nov. (maximum in July). Half are associated with thunderstorms. Peak of diurnal frequency is 1800-2100 local time in summer and 0900-1200 Oct.-April. In summer most come from SW-NW and in winter from NE and E quadrants. Forty-five percent last over an hour. Frequency of maximum wind speed, pressure, temperature and humidity changes and movement of squall (direction and speed) and relationships between these elements are summarized. *Subject Headings*: 1. Squall frequencies 2. Madras, India.—M.R.

5.1-152 551.515.8(52)
 Shinohara, Takeji, **On Japanese polar masses in winter**. *Tateno, Japan. Aerological Observatory, Journal*, 5(1):42-48, March 1951. 5 figs., 4 refs. DWB—Results of radiosonde observations and observations of upper air currents (1947-1950) were used to make synoptic analyses of cold fronts, "cold domes" and other phenomena within the cold air masses. Ascent curves, a vertical cross section and pressure maps in different heights are given. No results of special value are obtained. *Subject Headings*: 1. Cold fronts 2. Japan.—A.A.

5.1-153 551.515.8:551.588.2(52)
 Sugawara, Y., **Über die durch topographische Einflüsse entstandenen Diskontinuitäten**. [On discontinuity lines of topographic origin.] *Geophysical Magazine*, Tokyo, 1(1):19-25, March 1946. 13 figs., 3 refs. DWB—A synoptic statistical study of frequency of frontal passages in Central Honshu, Japan (1935-9) and the influence of mountains, coast line and the Japanese Current. In Jan. at least 28 fronts pass on the average, whereas in June, July and Aug. only 3 or 4 pass each month. There seems to be a singularity in Oct. (fewer than in Sept.). The fronts are said to be produced when air masses or currents from Siberia, crossing the Japan Sea (warm source) strike the mountain ranges of Central Honshu and split into two branches. One branch comes down to the Kanto Plain from the NW and is cold in comparison to the other branch which circles around and comes in from the SW as a warm moist air mass. *Subject Headings*: 1. Topographic influences 2. Frontal frequencies 3. Synoptic studies 4. Central Honshu, Japan.—M.R.

5.1-154

551.515.1(261)

Terebelski, Jan, **Comments on some upper lows in the Azores-Newfoundland region.** Pub. by Trans World Airlines, Inc., Meteorology Dept., [1953?] 12 p. 3 figs., 5 refs. Mimeo. DWB—Discussion of synoptic conditions leading to the formation of upper lows in the North Atlantic based on schematic contour-isotherm maps of the 500 mb surface, considering also typical features of the 300 mb surface. The main factor for the development of the upper low is the formation of a ridge across the central part of a deep trough over mid-Atlantic. *Subject Headings:* 1. Cold lows aloft 2. North Atlantic Ocean. I. Trans World Airlines, Inc., Meteorology Dept.—A.A.

5.1-155

551.515.8:551.515.73

Watanabe, Tadashi and Ito, Y., **On the displacement of a large scale air mass accompanied with a migratory anticyclone.** *Journal of Meteorological Research*, Tokyo, 3(13):449-454, Nov. 1951. In Japanese; English summary p. (29). DWB—In this theoretical analysis of the combined movements of migratory anticyclones moving toward the east and corresponding air masses coming from the north, the authors arrived at several rules regarding the final direction of large air masses as a function of the speed of particles in that air mass and of the speed of the anticyclone. Schematic diagrams are presented to illustrate the movement of air masses through several days and at various heights from ground level to 5 km. *Subject Headings:* 1. Air mass movements 2. Anticyclone movements.—G.T.

5.1-156

551.515.8:551.510.52/3

Zubian, G. D., **O planetarnoi vysotnoi frontal'noi zone.** [On the planetary upper-air frontal zone.] *Meteorologiya i Gidrologiya*, No. 7:10-16, 1952. 3 figs., 2 tables, 11 refs. DLC—The author notes that works published before by TABOROVSKIĭ, POGOSIAN, BUGAEV, DZHORDZHIO and others, and the practice of synoptic analysis showed the great importance of planetary upper-air frontal zones in development of atmospheric processes. These zones are observed near the tropopause and are more developed during spring and fall, when the first zone in middle latitudes is located over the southern boundary of the polar basin, and the second over the boundary of the middle and subtropical latitudes. During summer synoptic charts usually show only one zone. Three latitudinal zones of the earth with different values of radiation balance cause the formation of these frontal zones. Synoptic situations for the Northern Hemisphere during May 1-4 and Sept. 11-14, 1949 are presented as examples proving the existence of two zones, and situations on May 26-29 and Feb. 1-2, 24-25, 1949 as examples showing the confluence of both zones into one. *Subject Headings:* 1. Frontal zones 2. Tropopause.—N.T.Z.

RADIATION AND TEMPERATURE

RADIATION

See also: **Relationship: Radio-propagation disturbance, geomagnetic activity and solar noise** (van Sabben), 5.1-118; **Earth in radiation field of sun and universe** (Hanle), 5.1-296.

5.1-157

551.521.14

Burt, Wayne V. (Johns Hopkins Univ., Baltimore), **A note on the reflection of diffuse radiation by the sea surface.** *American Geophysical Union, Transactions*, 34(2):199-200, April 1953. table, 7 refs., 3 eqs. MH-BH—A re-examination of average albedo of a sea surface computed theoretically by SCHMIDT (1915) and comparison of SCHMIDT's value of 17% with JUDD's theoretical value of 6.6% and measured values obtained by various investigators (including the author) reveals that a lower value should be used for sea surface albedo than the one which persistently appears in the literature. *Subject Heading:* 1. Albedo of sea surfaces.—G.T.

5.1-158

551.521.4:551.593.55:551.510.534

Hulburt, E. O. (Naval Res. Lab., Wash., D. C.), **Explanation of the brightness and color of the sky, particularly the twilight sky.** *Optical Society of America, Journal*, 43(2):113-118, Feb. 1953. 7 figs., 2 tables, refs., 17 eqs. DWB—By use of the Rayleigh scattering theory

for pure air, primary scattering and known upper air densities from rockets, the brightness of the zenith twilight sky was calculated and values were obtained two to four times greater than those observed at Sacramento Peak, New Mexico (*J. Opt. Soc. Am.*, 42, 353, 1952). The attenuation of the atmosphere was observed to be twenty percent above that of the Rayleigh theory, and the ozone thickness was measured to be about 2.2 mm. When the absorption of the Chappuis band of ozone in the visible spectrum was added to the Rayleigh theory, the calculated sky brightness came into agreement with observation for solar depression angles below the horizon from about 0° to 6° . For the sun below 7° the calculated zenith sky brightness fell rapidly below the observed brightness, showing that primary scattering in the atmosphere about 60 km does not contribute appreciably to the brightness, as has long been known (*J. Opt. Soc. Am.* 28, 227, 1938). Calculation showed that during the day the clear sky is blue according to RAYLEIGH, and that ozone has little effect on the color of the daylight sky. But near sunset and throughout twilight ozone affects the sky color profoundly. For example, in the presence of ozone the zenith sky is blue at sunset and throughout twilight (as is observed), the blue at sunset being due about $\frac{1}{3}$ to Rayleigh and $\frac{2}{3}$ to ozone, and during twilight wholly to ozone. *Subject Headings: 1. Light of the night sky 2. Twilight phenomena 3. Ozone layer.—Author's abstract.*

5.1-159

551.521.4:551.521.64

Jelley, J. V. and Galbraith, W., *Light pulses from the night sky*. *Philosophical Magazine*, 4th Ser., 44(353):619-622, June 1953. 2 figs., 2 refs. DWB—Describes work on light flashes in clear weather, detected by a photomultiplier at the focus of a concave mirror. These are associated with cosmic rays and ascribed to radiation produced by them. The frequency increases exponentially with height of origin in the atmosphere. *Subject Headings: 1. Light of the night sky 2. Cosmic radiation.—C.E.P.B.*

5.1-160

551.521.4

Karimov, M. G., *Effektivnaia vysota svecheniia nochnogo neba dlia trekh spektral'nykh luchei*. [Effective height for night sky brightness for three spectral rays.] *Astronomicheskii zhurnal*, Moscow, 19(4):472-475, July/Aug. 1952. 2 tables, 3 refs. DLC—Report on experimental work using V. G. FESEKOV's calculation method. Brightness of sky as a function of effective height was computed by following equation:

$$I = I_0 \frac{(1+h)(p+x)^{\sec z}}{\sqrt{(1+h)^2 - \sin^2 z}}$$

where I is brightness of emission layer for zenith, p —coefficient of transparency, x —factor of diffusion light influence. The observations (Dec. 1950-Jan. 1951) showed that the brightness of red and green lines of the spectrum is associated with heights from 200 km up to 320 km and probably is formed in the F layer. At the same time the height of yellow line by the observations of twilight was established as 65 to 130 km. *Subject Headings: 1. Night sky brightness heights 2. Night sky spectrum.—N.T.Z.*

5.1-161

551.521.4

†Khvostikov, I. A., *Liuminestsentsiia atmosfery*. [Luminescence of the atmosphere.] *Uspekhi Fizicheskikh Nauk*, Moscow, 36(3):372-386, Nov. 1948. 4 figs., 16 refs., eq. DLC—A brief history of scientific study of atmospheric luminescence, beginning, of course, with LOMONOSOV (1750) and his interest in the aurora borealis, and continuing down to the discovery of the aurora australis, the light of the night sky (1919) twilight luminescence (1936) and artificial excitation of fluorescence in the atmosphere (1947). Separate sections of this carefully prepared review article take up the night and twilight luminescence; the sodium luminescence in the tropopause; nature of the light of the night sky (120-250 km height) and photoluminescence measurements and theory. In addition to the author's work, that of ELVERY and FARNSWORTH (1942) is discussed. *Subject Headings: 1. Light of the night sky 2. Photoluminescence 3. Sky light spectroscopy studies.—M.R.*

5.1-162

551.521.4

Krasovskii, V. I., *Novye izlucheniia nochnogo neba na uchastke 8000-11,000 Å*. [New radiation of the night sky in a zone of 8000-11,000 Å.] *Akademiia Nauk, SSSR, Krymskaia*

Astrofizicheskaia Observatoriia, Izvestiia, 5:100-104, 1950. 3 figs., 5 refs. **DLC**—A three-prism spectrograph with linear dispersion of about 1200-2400 Å on 1 mm was constructed for observations during 1950. These observations led to the discovery of six new lines of emission with wave length of 8870, 9391, 9976, 10,217, 10,374 and 10,827 Å. It was found that heavy emissions of night sky are present for many sections inside this range. *Subject Heading: 1. Night sky spectrum.*—*N.T.Z.*

5.1-163

551.521.4

Roach, F. E., Williams, D. R. and Pettit, Helen B. (*U. S. Naval Ord. Test Station, Pasadena and China Lake, Cal.*), **The diurnal variation of [OI]5577 in the nightglow; geographical studies.** *Journal of Geophysical Research*, 58(1):73-82, March 1953. 3 figs., 3 tables, 21 refs. Comments by Vassy, A. and Vassy, E., entitled "Lueur nocturne et activité aurorale" (Nightglow and auroral activity) *ibid.*, 58(2):283-284, June 1953. In French. **DLC**—In the region from N latitudes 36° to 44° the nightglow radiation [OI] 5577 has been reported to undergo a diurnal change in intensity, resulting on the average in an intensity maximum approximately one hour after midnight. The amplitude of the maximum is such that it is 1.3 times the mean intensity for the entire night. Marked departures from this average variation are noted on individual nights. Two simultaneous sets of observations at Cactus Peak in California and at the Haute Provence Observatory in France are studied in order to compare the diurnal variation at stations with a large difference of longitude. It is found that the variations have similar patterns in general but with significant differences in detail. On two occasions approximate triangulations on emission maxima yield a height of 180 km. Attention is called to a similarity between the diurnal variation of the nightglow 5577 at low latitudes and of the polar aurora at high latitudes. *Subject Headings: 1. Light of the night sky 2. Spectral line 5577 Å 3. Haute Provence Observatory, France 4. Cactus Peak, Calif. I. Vassy, A. II. Vassy, E.—Authors' abstract.*

5.1-164

551.521.4

Roach, F. E., Williams, D. R. and Pettit, Helen (*U. S. Naval Ord. Test Station, China Lake, Calif.*), **Diurnal variation of [OI] 5577 in the nightglow.** *Astrophysical Journal*, Chicago, 117(3):456-459, May 1953. 4 figs., 2 tables. **DLC**—Measurements of intensity of 5577 made at Cactus Peak (Calif.) during two nights (Jan. 1951, Nov. 1952) are reported and discussed. Isophote maps for each hour and variation diagrams are presented. Attention is called to an apparent motion of the localized maximum which is east-to-west before, and west-to-east after the maximum intensity is reached. During the maximum the motion stops. These observations were made by the U. S. Naval Ordnance Test Station, China Lake, Calif. (For earlier paper on the subject see 4.4-136, April 1953, *MAB.*) *Subject Headings: 1. Light of the night sky 2. Spectral line 5577 Å 3. Cactus Peak, Calif.—G.T.*

5.1-165

551.521.61:551.511

†Elsasser, Walter M. and King, J. I., **Principles of radiative transfer in far infrared atmospheric bands.** Utah. University. Dept. of Physics, Contract AF 19(122)-392, Technical Report, No. 6, Sept. 30, 1952. 105 p. 10 figs., 30 refs., eqs. **DWB**—A comprehensive review of the present knowledge of radiative properties of the atmosphere and radiative transfer. The history of investigations of radiative balance and measurement of the elements thereof are summarized. Applications such as to the problem of the ice ages, the formation of the stratosphere and of frost and fog forecasting are also mentioned briefly. The main part of the report consists of a detailed exposition of the theory that governs the infrared radiative processes in the atmosphere (absorption of sunlight in near infrared and transfer in the far infrared). Not only the mathematical and physical data but some sample models are presented. *Subject Headings: 1. Radiative transfer 2. Infrared radiation 3. Atmospheric structure. I. Utah. University. Dept. of Physics II. Contract AF 19(122)-392.—M.R.*

5.1-166

551.521.63:535.24

Barbier, Daniel, **Étude photométrique de la région ultraviolette de la lumière du ciel nocturne.** [Photometric study of the ultraviolet region of nightglow.] *Annales d'Astrophysique*, 16(2):96-128, 1953. 16 figs., 5 tables, 14 refs. **DWB**—An automatic photometer,

and its filter, installed at the Haute-Provence Observatory are described. Measurements of UV radiation made with the instrument (Sept. 1951–Aug. 1952) at zenithal distances 75° and 45° are analyzed in detail. Atmospheric diffusion and extinction are considered. The altitude of emission is found to be 200 ± 50 km. Diurnal and annual variations of intensity show definite resemblance to those of green light. Localized emission observed on three occasions is attributed to auroras too weak for direct observation. *Subject Headings: 1. Photometry 2. Ultraviolet variations 3. Light of the night sky 4. Haute-Provence Observatory, France.—G.T.*

5.1-167

551.521.64

Messel, H. and Green, H. S. (*Univ. of Adelaide, S. Australia*), **The angular and lateral distribution for the nucleon component of the cosmic radiation.** *Physical Review*, 2nd Ser., 87(5):738-747, Sept. 1, 1952. 25 refs., table, 85 eqs. **DLC**—A method, generally applicable in reconstructing the distribution functions when only the moments are known, is developed and demonstrated. Various initial conditions are found, and numerical results of an integral primary proton low spectrum with exponent $Y=1.1$ is presented. Variation of atmospheric density with height is considered. *Subject Heading: 1. Cosmic radiation.—W.N.*

5.1-168

551.521.64(98)

The Navy hunts cosmic rays. *Popular Mechanics Magazine*, Chicago, 99(3):103-105, 1953, 266, 268, 270, March 1953. photos, illus. (in color) incl. cover. **DWB**—Popular account of U.S.N. "Eastwind's" polar expedition. Purpose of the trip was the measurement of cosmic rays by balloon-borne equipment and by Deacon rockets carried up to a considerable height by balloons and automatically launched from there. Data obtained are discussed in general terms. *Subject Headings: 1. Cosmic ray measurement 2. Arctic expeditions.—G.T.*

AIR TEMPERATURES

See also: Air temp., Tokyo (Kato), 5.1-38; Temp. at Geneva, 1836-1855 (Plantamour), 5.1-40; Winter temp., Toronto (Thomas), 5.1-43; Mean temp. of atmos. ozone (Vassy, Vassy), 5.1-112; Existence of polar front at 500 mb (Bradbury, Palmén), 5.1-146; Influence of etesian winds on summer temp., Athens (Karapiperis), 5.1-201; Influence of sea on temp. (Arnaud), 5.1-292.

5.1-169

551.524.2(471.1)

*Keränen, J., **Temperaturkarten von Finnland für den Zeitraum 1901-1930.** [Temperature charts for Finland, 1901-1930.] *Finland. Ilmatieteellinen Keskuslaitos, Toimituksia*, No. 36, 1952. 19 charts. **DWB**—Isothermal charts of mean temperature are presented for Finland for each month and for the year for intervals of 1°C . Also the dates of beginning and end of winter and of summer (mean temperatures $<$ and $> 0^\circ\text{C}$, and 10°C resp.) and of the growing season ($>$ and $< 5^\circ\text{C}$) based in means for 1901-30. A previous set of charts had been published in 1925 for 1891-1920 by the author. *Subject Headings: 1. Isothermal charts 2. Finland 3. Temperature charts.—M.R.*

5.1-170

551.524.31

Jaeger, J. C. (*Canberra, Australia*) and Johnson, C. H. (*Hobart, Tasmania*), **Note on diurnal temperature variation.** *Geofisica Pura e Applicata*, 24:104-106, Jan./April 1953. fig., 3 refs., 6 eqs. **MH-BH**—BRUNT's formula for diurnal variation of surface temperature at equinox is extended to allow calculations for any time of sunrise or sunset. Curves show theoretical variation for sunset at 4, 6 and 8 p.m., respectively, giving the time of maximum at 1.9, 2.4 and 2.9 hours after noon instead of smaller values as calculated by BRUNT or JAMES' formulas. Heat transfer to the air is neglected, however, so empirical results may vary considerably from theoretical. *Subject Headings: 1. Diurnal temperature variations 2. Brunt's formula.—M.R.*

5.1-171

551.524.32:551.508.71

Heckert, Lothar, **Die Bedeutung kurzfristiger Temperaturschwankungen für die üblichen Temperatur- und Feuchtemessungen mit dem Aspirations-Psychrometer nach Assmann.**

[The significance of short period temperature variations for the usual temperature and humidity measurements with Assmann's aspiration psychrometer.] *Zeitschrift für Meteorologie*, 7(1):19-23, Jan. 1953. 3 figs., 4 refs. **MH-BH**—Assmann's psychrometer is too sensitive for macrometeorological observations where short period temperature and moisture fluctuations must be eliminated. From this point of view, thermo- and hygrographs give better results. Author uses a special test box for an occasional calibration of these recording instruments with the Assmann psychrometer. *Subject Headings*: 1. Temperature measurement 2. Assmann's aspiration psychrometer.—A.A.

5.1-172

551.524.32(52)

*Ogawara, M. and Yamazaki, H., *Singularities in the annual variation of temperature in Japan*. *Meteorological Society of Japan, Journal*, 31(3):95-116, March 1953. 11 figs., 12 tables, 21 refs. **MH-BH**—A detailed statistical study of the temperature minima of April 5-6 and April 22-23 over Japan. The longest temperature records used are those for Fukuoka (1890-1945), Tokyo (1875-1949) and Abashiri (1890-1945). Correlation with pressure and circulation characteristics is investigated. It is found that the two singularities (unrelated to each other) can be directly derived from the typical circulation pattern prevailing in the Far East. *Subject Headings*: 1. Temperature singularities 2. Statistical studies 3. Japan.—G.T.

5.1-173

551.524.33(82):551.501.45

*Dedeant, Georges and Machado, Emilio A. M., *Cálculo del promedio mensual de temperatura en base a las tridiurnas*. [Calculation of the monthly mean temperature based on the average of thrice daily synoptic observations.] *Meteoros*, Buenos Aires, 2(3/4):190-203, July/Dec. 1952. 2 figs., tables, 2 refs., eqs. English summary, p. 190. **DWB**—An elaborate set of statistical tests was made for determining the accuracy of mean monthly temperatures for the various months of the year from thrice-daily observations compared to those calculated from hourly, two-hourly, 6-, 12-, 18-, 20- and 24-hourly observations. The customary synoptic 8-hourly observations are shown to present a singularity, the variation of which (from the "true" mean) is shown in extensive tables for the various months from 1939-1948, based on data for the Central Meteorological Observatory, Buenos Aires, Argentina. Formulas are proposed for calculating the mean monthly temperature during each month from thrice-daily (8, 14 and 20 h) synoptic observations at Buenos Aires. *Subject Headings*: 1. Temperature calculations 2. Statistical techniques 3. Synoptic temperature observations 4. Buenos Aires, Argentina.—M.R.

5.1-174

551.524.34(777)

551.577.34(777)

Barger, Gerald L. (*Iowa State College, Ames*), *Iowa weather, 1953*. *Iowa Farm Science*, Ames, Iowa, 7(7):13-14, Jan. 1953. 2 charts. **DWB**—A "forecast" based on probabilities that rainfall will be within certain limits in various sections of Iowa, or that temperatures will be in certain ranges at various times of the year, is presented in the usual graphic form on maps of Iowa. Corrections to adjust the normals for central Iowa to other parts of the state are indicated on the appropriate portion of the map. This approach assumes no change in normals in the future, and it is emphasized that this is not a forecast in the usual sense of the word. *Subject Headings*: 1. Temperature probability 2. Precipitation probability 3. Iowa.—M.R.

5.1-175

551.524.34(52)

*Ozawa, T. and Fujita, T. (*Met. Res. Inst., Japan*), *Climatic change in the Tohoku District (I, II, III)*. *Meteorological Society of Japan, Journal*, 2nd Ser., 30(5,6):166-182, 190-202; 31(3):77-94, May, June 1952; March 1953. 11 figs., 5 tables, 5 refs., eqs. In Japanese; English summaries p. 166, 190, 77. **DWB**—In Chap. 1 of this extensive study, secular variations in summer temperature and in the occurrence of droughts in Tohoku District are analyzed and several periodicities established. Data on which the analysis is based include records of bad harvests for the period 1610-1949. In Chap. 2 it is found that mean Aug. temperature in Miyako corresponds with that in the entire Tohoku District. A periodogram and correlogram analysis is applied to mean Aug. temperature series based on observation records

for the period 1883-1949. In Chap. 3 the stochastic analysis of mean Aug. temperature at Miyako is undertaken on the basis of six components (secular trend, three harmonics and two fluctuations with two cyclic periodicities). Chap. 4 deals with the correlation between Aug. temperature anomalies and other synoptic elements. Close correlation is found between temperature anomalies and upper westerly currents (at Tatenos) as well as Aug. typhoons. A correlation is also established between WOLF's sunspot numbers and subsequent temperature series. In Chap. 5 the correlogram and periodogram analysis is applied to monthly temperatures at Miyako and to fluctuations of Aug. mean temperature and pressure at various stations in the Far East. *Subject Headings:* 1. Temperature variations 2. Temperature periodicities 3. Temperature anomalies 4. Long period records 5. Tohoku District, Japan.—G.T.

5.1-176

551.524.35(73)

Ludlum, David M. (ed.), *A mild winter across the nation*. *Weatherwise*, 6(2):54-56, April 1953. **MH-BH**—The winter (Dec.-Feb.) of 1952-53 was one of the warmest in history for the entire U.S.A. Although 1931-32 and 1933-34 were warm in parts of the country not since 1920-21 has it been so warm throughout the country. Europe had a continental type of winter, and a large HIGH over Siberia poured cold air southward in all directions. Over the U.S.A. the flow was strong from the WSW, precluding many outbreaks of arctic air. The Florida peninsula was the only portion below normal for the 3-month period. In Montana the anomaly was $+16^{\circ}$ to $+20^{\circ}\text{F}$ in Jan. and the Great Lakes were free from ice than at any time on record. Record rainfall occurred in the Pacific Northwest (200% of normal in Jan.) as the moist westerlies piled up against the Coast Ranges. Snow was generally deficient. *Subject Headings:* 1. Mild winters 2. Temperature anomalies 3. United States.—M.R.

5.1-177

551.524.36(45)

*Campa, Maria, *Deduzione matematica della temperature estreme a Milano (Brera) da 111 anni di osservazione (1838-1948)*. [Mathematical deductions of extreme temperature at Milan (Brera), based on 111 years of observation, 1838-1948.] *Italy. Ufficio Idrografico del Po, Parma, Pubblicazione*, No. 11, v. 7, 1952. 21 p. 2 figs., 4 tables. *Milan. Osservatorio Astronomico de Milano-Merate, Pubblicazioni*, N.S., No. 6. **DWB**—The mean maximum and minimum temperatures for each of the 73 pentades of the year are developed in a harmonic series with 5 waves. The synoptic curve is computed and the differences between observed mean and calculated values are shown. "Normal" extreme temperatures are given for each day of the year. Another table presents the extreme observed temperatures for each year. *Subject Headings:* 1. Temperature data 2. Statistics in climatology 3. Temperature extremes 4. Long period records 5. Milan, Italy. I. Milan. Osservatorio de Brera.—A.A.

5.1-178

551.524.36:551.584.31

Davies, J. L., *Some effects of aspect upon valley temperatures in South Cardiganshire*. *Geography*, Sheffield, 37(1):19-23, 1952. 2 figs., tables, 8 refs. **DLC**—Comparison of temperatures at a hill-top (600 ft) and two valley stations (one at 150 ft facing SSW and one at 340 ft facing ESE). Maxima highest by $2-3^{\circ}\text{F}$ in valley facing south, minima lowest in valley facing E. *Subject Headings:* 1. Topographic effects 2. Temperature extremes 3. Cardiganshire, Wales.—C.E.P.B.

5.1-179

551.524.36:551.515.8(79)

*Hughes, Grover D. and Ross, Robert B. (U. S. W.B.), *Low minimum temperatures of June 12-13, in the far west*. *Monthly Weather Review*, 80(6):105-109, June 1952. 12 figs., table, 4 refs. **DWB**—On June 10, 1952 a low pressure system appearing as a closed circulation centered at the 700 mb level off the British Columbia coast combined with an old cut-off low moving inland from off the California coast, forming a major low pressure trough. The circulation preceding this situation and subsequent developments with record values of low surface and upper air temperature are described and illustrated by means of surface and upper air charts. Minimum temperature data for June 12 and 13, 1952 are tabulated for 25 locations in four western states and compared with previous June minimum temperature records. *Subject Headings:* 1. Minimum temperatures 2. Synoptic studies 3. Temperature extremes 4. Western United States.—G.T.

5.1-180

551.524.37:551.575.5

Gold E., **Unusual temperatures recorded during fog.** *Meteorological Magazine*, London, 82 (1974):246-247, Aug. 1953. table, 3 refs. MH-BH—March 3, 1953, near London, screen temperature $28\frac{1}{2}^{\circ}\text{F}$, fog, dew on ground, no frost. A surface temperature 3°F above screen temperature during shallow dense fog may be caused by radiation from fog surface. *Subject Headings*: 1. Frost 2. Fog 3. Temperature anomalies 4. London, England.—C.E.P.B.

SOIL TEMPERATURES

5.1-181

551.525.4:58(774)

*Crabb, George A., Jr. and Smith, James L., **Soil-temperature comparisons under varying covers.** *National Research Council, Wash., D. C. Highway Research Board, Bulletin*, 71:32-80, 1953. 5 figs., numerous tables, 14 refs. Discussion by Carl B. Crawford, p. 48-49. 7 refs. Abstracted from reprint.—Tables and graphs of soil temperature to a depth of 60 in. and corresponding average air temperatures are presented for soil under forest cover, small grain and meadow giving daily values for 1947-1951. The data are based on measurements made at the Michigan Hydrologic Research Station near East Lansing during the period 1947-1951. Soil properties and climatic conditions are discussed. Total precipitation and insolation are indicated. The seasonal variation of response of soil temperature to air temperature is analyzed. *Subject Headings*: 1. Soil temperature variations 2. Vegetation influences 3. East Lansing, Mich. I. Crawford, Carl B.—G.T.

5.1-182

551.525.4:536.2

Kaganov, M. A. and Chudnovskii, A. F., **Ob opredelenii koeffitsienta temperaturoprovodnosti pochvy.** [Determination of the coefficient of temperature conductivity of soil.] *Akademiia Nauk, S.S.S.R., Izvestiia, Ser. Geofizicheskaiia*, No. 2:183-190, 1953. 3 tables, 10 refs., 23 eqs. DL—Methods for determining the coefficient of heat conductivity of the soil based upon the fact that it has a periodic character are surveyed. The coefficient of heat conductivity is determined by measuring soil temperatures at two depths for the diurnal, semiannual or annual periods. Equations for calculating the coefficient of heat conductivity in homogeneous and nonhomogeneous soil and examples of the calculation of this coefficient are given. *Subject Headings*: 1. Soil temperatures 2. Heat conductivity of soil 3. Heat conductivity coefficient.—I.L.D.

5.1-183

551.525.4:551.578.46

De Backer, Simon, **Temperature superficielle du sol sous le gazon recouvert de neige, hiver 1950-1951 à Uccle.** [Surface temperature of the soil under grass covered with snow during the winter 1950-51 at Uccle.] *Belgium. Institut Royal Météorologique, Mémoires*, v. 51, 1952. 8 p. 3 figs., table. DWB—Daily soil temperatures (Nov. 30, 1950-Jan. 8, 1951) at depths of 5, 20 and 100 cm were measured by means of copper-constantan thermocouple; and air temperature was measured at 1.50 cm. A table gives these values together with mean surface temperature of the soil at 1200 hr, maximum and minimum temperatures between 0 and 2400 hr, maximum and minimum air temperature between 0 and 2400 hr, thickness of snow cover, wind direction and velocity and source of water received in the rain gage and a graphic representation of these data together with methods of correlation and the course of mean surface soil temperature from Nov. 18 to Jan. 9, 1951 are given. The coefficient of thermal diffusion of the snow is calculated 1) by the relationship between amplitudes and 2) by the displacement of sinusoidal waves and a close agreement is found: $k = .0012$ and $.0010$, respectively. The protective action of snow cover upon vegetation with reference to temperature, humidity and aeration are discussed. *Subject Headings*: 1. Soil temperatures 2. Snow cover effects.—I.L.D.

SEA TEMPERATURES

5.1-184

551.526:551.46

*Whaley, H. H. and Hopkins, T. C., **Atlas of the salinity and temperature distribution of Chesapeake Bay, 1949-1951.** Johns Hopkins University. Chesapeake Bay Institute, Contract Nonr 248 (2), Graphical summary report, No. 1, March 1952. unpagd. Mostly

graphs and diagrams. DWB—Atlas presents for each of eight cruises (1 winter, 2 spring, 2 summer, 2 fall) horizontal distribution charts of salinity and temperature at the 0, 10, 20, 40, 60 and 80 ft levels, vertical salinity and temperature cross sections and one vertical section summing up the main channel. Salinity cross sections show the usual picture of a downward stream in the upper layers and an upward stream with higher salinity in the lower layer. More interesting is the horizontal displacement of these streams indicating in all cases a cyclonic circulation on the salinity charts and cross sections. *Subject Headings:* 1. Water temperature distribution 2. Salinity distribution 3. Chesapeake Bay, Md. I. Johns Hopkins University. Chesapeake Bay Institute. II. Contract Nonr 248 (2).—A.A.

5.1-185

551.526.6(261)

Böhnecke, Günther and Dietrich, Günter, *Monatskarten der Oberflächentemperatur für die Nord- und Ostsee und die angrenzenden Gewässer*. [Monthly charts of surface water temperature for the North- and Baltic Sea and the surrounding seas.] Hamburg, Deutsches Hydrographisches Institut, 1951. 1 p. text, 3 tables, 13 maps. DWB—Area covered besides the North and Baltic Seas: English Channel, Irish Sea, North Atlantic from 5 to 66°N up to 10°W. Data reduced to the period 1906-1938. (For paper on the reduction method used see item 2.6-75, June 1951, MAB.) Distance of isotherms 0.5°C. Data (over 1 million single values) are based on ship observations, combined in 1-degree fields and on observations on light ships and at coastal stations. Number of observations for Aug. and Feb. presented on map. Monthly and annual means for fixed observational points presented in table 3. Data from ship observations are carefully corrected according to DIETRICH (see item 2.6-75, June 1951, MAB). Annual distribution of temperature is given in another paper (*Deutsche Hydrographie Zeitschrift*, 4, 1951). General warming (=1°C) observed since 1930. The maps give also the ice probability 50-100% and the maximum ice distribution in the years 1920-1950. *Subject Headings:* 1. Sea surface temperatures 2. Marine atlases 3. Sea ice distribution 4. North Sea 5. Baltic Sea 6. North Atlantic.—A.A.

5.1-186

551.526.8

*Millar, Frederick Graham (Canada, Met. Div.), *Surface temperatures of the Great Lakes*. Canada. Fisheries Research Board, *Journal*, 9(7):329-376, 1952. 27 figs., refs. Abstracted from reprint. DWB—Comprehensive study based on thermograph data for 5 to 10 years. Instruments were installed on the condenser intakes of steamships. Author presents a chart of currents, analyzes the annual variation of temperature for each lake, presenting time cross-sections for the steamer routes. First attempt made to draw isotherms for each month. Standard deviations and autocorrelations computed in order to characterize the persistence of lake temperatures. *Subject Headings:* 1. Lake temperatures 2. Isothermal charts 3. Great Lakes.—A.A.

PRESSURE AND WIND

PRESSURE

See also: Atmos. circulation, S. Africa (Jackson), 5.1-134; Wind computation from pressure data (Neiburger and others), 5.1-207; Sound velocity in air at low pressures (Caro, Martin), 5.1-313.

5.1-187

551.542:551.588.2 551.515(52):551.588.2

Suzuki, Seitaro (Centr. Met. Obs., Tokyo), *Orographic influence on atmospheric pressures and currents*. (V). Meteorological Society of Japan, *Journal*, 30(10):305-312, Oct. 1952. 22 figs., 9 refs. MH-BH—The author presents surface and upper air charts superimposed on orographic maps to show the close relationship between orography and pressure and circulation pattern. Static and dynamic theories accounting for this relationship are discussed. The paper includes examples of orographic effects on typhoons. *Subject Headings:* 1. Orographic effects 2. Pressure patterns 3. Circulation patterns 4. Typhoons 5. Japan.—G.T.

5.1-188

551.543:525.6(02) 551.510.535(02)

Defant, Albert, *Ebbe und Flut des Meeres, der Atmosphäre und der Erd feste*. [Ebb and flow of the oceans, the atmosphere and the solid earth.] Berlin, Springer-Verlag, 1953.

119 p. 64 figs., 8 tables. *Verständliche Wissenschaft*, [No.] 49. GB-MO—This little book deals in a popular way with the observation, theory and prediction of oceanic and coastal tides, oscillations and seiches of inland waters, internal tides, atmospheric oscillations, tides in the ionosphere, and in the solid earth. *Subject Headings*: 1. Tides 2. Atmospheric tides 3. Ionospheric tides 4. Textbooks.—C.E.P.B.

5.1-189

551.543.1

Lewis, L. F., **Exceptionally high mean pressure over the British Isles.** *Meteorological Magazine*, London, 82 (974):250-251, Aug. 1953. 2 figs. MH-BH—Maps of monthly mean pressure, March 1929 and March 1953, closely similar, both showing anticyclone centered over S. England. *Subject Headings*: 1. Pressure variations 2. British Isles.—C.E.P.B.

5.1-190

551.543.1 (825.1)

Georgii, Walter, **Regulación del tiempo por la doble onda diaria de la presión atmosférica, en Mendoza.** [Weather changes in Mendoza due to the semidiurnal atmospheric pressure.] *Meteoros*, Buenos Aires, 2 (3/4):182-189, July/Dec. 1952. 5 figs. English summary p. 182. DWB—Examples of records of pressure, temperature and humidity and of thunderstorm activity in the province of Mendoza (1951) are cited and illustrated to support the author's theory of the formation of lee thunderstorms (in series moving from the Andes toward the east with the upper current against the westward moving surface easterlies). The marked semidiurnal pressure wave results in a temporary strengthening of the westerlies in the early morning and afternoon (minimum pressure) and strengthening the easterlies in the noon and midnight hours (maximum pressure). The wind changes also produce temperature changes and have a relation to the strength of the Zonda. A model of the complex circulation resulting in the heavy rainstorms of Dec. 1951 is shown cross sectionally. *Subject Headings*: 1. Semidiurnal pressure waves 2. Lee waves 3. Zonda 4. Mendoza, Argentina.—M.R.

TURBULENCE

See also: Internatl. Symposium on Atmos. Pollution (Hewson), 5.1-5; Gust speeds, Canada (Thomas), 5.1-42; Wind studies on shielded snow gages (Warnich), 5.1-66; Ion concentration variations (Norinder, Siksna), 5.1-305.

5.1-191

551.551:629.315

Frederickson, Paul S., **Effect of encountering a wind shift during a turn.** *Trans World Airlines, Inc., System Operations Bulletin*, No. 52-5, March 3, 1952. 3 p. diagr. Mimeo. DWB—A study of the flight path of a United Airlines Douglas DC-3 which crashed near the runway at Fort Wayne, Ind. on April 28, 1951 at 1931 CST, and of meteorological conditions during a violent frontal squall which was responsible for the accident, shows that it is safer to make a right turn than a left turn when entering such a squall, and even safer to enter the squall line at right angles to the wind shift line since this involves the shortest flight path through the downdraft zone. The plane in question evidently was carried by the squall (with gusts up to 80 mph) for 2 or 3 mi. Another flight made the same flight path without accident but being a few seconds earlier was not caught by the approaching squall. *Subject Headings*: 1. Aircraft accidents 2. Line squalls.—M.R.

5.1-192

551.551:551.556.2

*Iizuka, Hajime, **Research on the correlation between the turbulence intensity and the wind velocity on the leeward of windbreak as one method to judge the function of windbreak.** *Tokyo, Japan. Forest Experiment Station, Bulletin*, No. 56:225-231, Dec. 1952. 5 figs., 5 tables. In Japanese. DWB—A brief article with correlations shown graphically and in tables. *Subject Headings*: 1. Turbulence intensity correlations 2. Windbreak effectiveness 3. Turbulence behind trees.—M.R.

5.1-193

551.551:551.510.42:628.53

Ogura, Y. (*Geophys. Inst., Tokyo Univ.*), **The theory of turbulent diffusion in the atmosphere. III. (The theoretical distribution of airborne pollution from tall stacks.)** *Meteoro-*

logical Society of Japan, Journal, 30(12):386-397, Dec. 1952. 8 figs., 14 refs., 6 eqs. **MH-BH**
 The author's theory of isotropic turbulent diffusion developed in Pts. I. and II. of this
 paper (see items 4B-276 and 4B-316, Feb. 1953, *MAB*) is applied to the case of elevated
 continuous point sources of atmospheric pollution. Results of the theoretical analysis are
 compared with similar results of other authors and with observed data. The application of
 the formulas is illustrated by a numerical example. *Subject Headings: 1. Turbulence theory*
Turbulent diffusion 3. Stack effluents.—G.T.

5.1-194

551.551

Robinson, G. D., **Some examples of the energy spectrum of turbulence in the atmosphere**
near the ground. *Great Britain. Meteorological Research Committee, M.R.P.*, 808, May 11,
 1953. 11 p. 4 figs., 5 tables, 6 refs. Mimeo. **DWB**—A number of hot wire records of air
 speed, 150 cm above ground at Kew Observatory, including large positive and negative tem-
 perature gradients, were analyzed by autocorrelation of readings at intervals of $\frac{1}{2}$ or $\frac{1}{4}$ sec.
 The three components of turbulent motion were equal (isotropic turbulence) at frequencies
 of 3 cycles/sec to limit of observation at 8 c/sec, and energy varied as inverse square of fre-
 quency, in accord with Kolmogorov. Horizontal components were equal above 1.5 c/sec.
 The local rate of viscous dissipation appeared to balance the local rate of working of Reynolds
 stress. *Subject Heading: 1. Turbulence spectrum.—C.E.P.B.*

5.1-195

551.551:533.17

Sedov, L. I., **K obshchei teorii odnomernykh dvizhenii gaza.** [On the general theory
 of one dimensional gas movements.] *Akademiia Nauk, SSSR, Doklady*, 85(4):723-726,
 Aug. 1, 1952. 2 refs., 4 eqs. **DLC**—The author analyzes the irregular movements of an
 ideal gas for the flat, cylindrical and spherical waves and suggests a system of equations for
 conditions of adiabatic movement of any gas and for cases of gas movement occurring inside
 a striking wave. *Subject Headings: 1. Turbulent flow 2. Wave equations.—N.T.Z.*

WIND

See also: **Electrical properties of blizzards** (Barré), 5.1-2; **Vertical eddy flux of momentum**
in trade wind zone (Palmén), 5.1-127.

5.1-196

551.553.1/2

Bleibaum, Irma, **Feststellung lokaler Windsysteme mit Hilfe von Beobachtungen**
und Registrierungen der Windrichtungen. [Determination of local wind systems by ob-
 servations and records of wind directions.] *Germany. Deutscher Wetterdienst in der US-Zone,*
Berichte, No. 42:204-208, 1952. 3 figs., table, 8 refs. **DWB**—From anemograph records at
 Wasserkuppe (923 m), Friedrichroda (450 m) and Brocken (1142 m) the diurnal variations
 of wind direction in mountain and valley winds are compared and a seasonal wind system
 between Alpine chain and foreland deduced. *Subject Headings: 1. Diurnal wind variations*
2. Alps.—C.E.P.B.

5.1-197

551.553.21

Petterssen, Sverre (*Univ. of Chicago*), **On the dynamics of the Indian monsoon.** *Indian*
Academy of Science, Proceedings, Sec. A, Bangalore, 37(2):229-233, Feb. 1953. 6 eqs. **DLC**—
 The author deals theoretically with the problem of maintenance of the normal or steady
 summer monsoon circulation at low levels over India. He shows how it is a self-sustaining
 system, not being dependent on coupling with perturbations from neighboring regions, but
 being driven by local heat sources and modified or balanced by the frictional forces produced
 by the Western and Eastern Ghats, the Burma and Assam Mountains and the Himalayas.
 Some variations in the monsoon, however, may be due to cyclonic activity outside the area.
 The jet stream usually lies north of India so that relative and absolute vorticity decrease with
 elevation. The effect of friction is to decrease motion and it reduces or increases vorticity

as the motion is cyclonic or anticyclonic, respectively. *Subject Headings:* 1. Monsoon circulation theory 2. Vorticity 3. India.—M.R.

5.1-198

551.553.21

*Visser, S. W., **Some remarks on the European monsoon.** *Geofisica Pura e Applicata*, 24:135-148, Jan./April 1953. 7 figs., 5 tables, 13 refs. DWB—The frequency and strength of the monsoon (NE-E in May and S or SW in Nov.) which alternates with westerly type (cyclonic) circulation over the Netherlands and vicinity, are studied statistically using 42 years (1910-1951) record for Den Helder and Maastricht, and illustrated graphically. The author thinks that the singularities of FLOHN and HESS have no reality and are of little use in studying the monsoon regime of western Europe. He presents KHROMOV's chart of the monsoon regions of the earth and cites KHROMOV's definition which is used in the present study. Monthly means used in most wind roses do not show the monsoon as they combine the two types of circulation and hence smooth out the real factors. Ten-day periods are used and calculations are based on the product of the frequency of the direction by the speed (relative wind vector). Nov.-Dec. and May-June are the best months to show the monsoonal reversal of wind pattern, rather than the orthodox Jan. and July. *Subject Headings:* 1. European monsoons 2. Monsoon circulation 3. Wind frequency diagrams 4. Netherlands.—M.R.

5.1-199

551.554 551.557

Ogura, Yoshimitsu (*Geoph. Inst., Tokyo Univ.*), **Note on the wind velocity profile in the non-adiabatic atmosphere.** *Meteorological Society of Japan, Journal*, 30(10):329-341, Oct. 1952. 4 figs., 11 refs., 5 eqs. MH-BH—An equation representing variations of wind with height is derived from a basic equation of the energy balance of turbulence. The theoretical results are compared with observational material. Similar equations suggested by other authors are reviewed. *Subject Headings:* 1. Wind profiles 2. Energy equations 3. Thermodynamics of the atmosphere.—G.T.

5.1-200

551.555

†Troll, Carl, **Die Lokalwinde der Tropengebirge und ihr Einfluss auf Niederschlag und Vegetation. Studien zur Vegetations- und Landschaftskunde der Tropen, III.** [Local winds on the tropical mountains and their influence on precipitation and vegetation. Studies on vegetation and geography of the tropics, III.] *Bonner Geographische Abhandlungen*, Bonn, No. 9:124-182, 1952. 13 figs. (incl. 1 fig. in pocket), tables, 69 refs. DWB—The formation of local winds in the mountain chains that traverse South America and Africa from north to south, the effect these winds have upon precipitation and vegetation and the occurrence of drought pockets in valleys are discussed very thoroughly. The following topics are considered: the diurnal climate of the tropics, the diurnal mountain winds including upslope wind, "compensating" winds and mountain and valley winds; the compensating winds of the central plateau—the Bolivian-Peruvian Altiplano; drought pockets and wind gaps of the Andean escapement of Northeast Bolivia; three-dimensional arrangement of the vegetation in the transverse valleys, wind gaps and drought pockets in southeast Bolivia, in the Peruvian Andes and in the equatorial Andes; the plateaus of east Africa between the Red Sea and the Cape of Good Hope; ascending rainfall in the Cape region, the eastern escapement of the south African plateau in Natal; the edge of the east African Plateau and the compensating winds between the Red Sea depression and the surrounding plateaus. *Subject Headings:* 1. Local winds 2. Wind effects 3. Precipitation 4. Vegetation 5. Tropical climatology 6. Topographic effects.—I.L.D.

5.1-201

551.555.4:551.524.35(495)

Karapiperis, Leonidas N., **Influence of the etesian winds on the summer temperature in Athens.** *Meteorological Magazine*, London, 82(974):238-239, Aug. 1953. fig., 6 refs. MH-BH—Mean summer temperature in Athens 1901-1950 runs closely parallel to frequency of

esian days, but owing to dryness such days seem fresher than sea breeze days. *Subject Headings: 1. Etesian winds 2. Athens, Greece.—C.E.P.B.*

WIND EFFECTS

See also: Correlation between turbulence intensity and wind velocity . . . (Iizuka), 5.1-192.

5.1-202 551.556:551.311.3 551.577.61:551.311.2
*Kiselev, A. N., *Sviaz' mezhdru vodnoi erozii i deflatsiei pochvy*. [Relation between water and wind erosion.] *Pochvovedenie*, Moscow, No. 9:840-850, Sept. 1952. 19 tables, 12 refs. DLC—Experimental research under carefully defined conditions. Size distribution of soil particles given before and after water erosion (5 ml water over 1 cm²/min, total amount of water 1 l) and deflation by wind (10 m. sec.⁻¹ for 3 minutes and other combinations). *Subject Headings: 1. Soil erosion 2. Wind erosion 3. Experimental soil science.—A.A.*

5.1-203 551.556:551.465
SHtokman, V. B., *Primenenie metoda polnykh potokov dlia rascheta tsirkulatsii, vozdukhdaemoi neravnomernym vetrom v more ellipticheskoi formy*. [Application of the method of total currents for calculation of circulation induced by irregular wind in the sea of elliptical form.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geofizicheskaiia*, No. 5:57-68, 1952. 5 figs., 12 tables, 12 refs., 19 eqs. DLC—Solutions of differential equations given for the total resulting current in an inhomogeneous ocean dependent on the given distribution of the longitudinal wind forces on the surface of the ocean and knowing the coefficient of lateral exchange. Border conditions for the seashore are considered. A circular and a parallel wind distribution is discussed and the limiting cases of a circle and an "indefinitely long channel, limited in the indefiniteness" is studied. *Subject Headings: 1. Ocean currents 2. Ocean-atmosphere interaction 3. Surface friction.—A.A.*

5.1-204 551.556:551.465
von Arx, William S. (*Woods Hole Oceanographic Inst.*), *A laboratory study of the wind-driven ocean circulation*. *Tellus*, 4(4):311-318, Nov. 1952. 4 figs., 8 refs. MH-BH—A detailed description of the construction and operation of a rotating oceanographic model capable of simulating the ocean circulation is presented. It consists of a basin having the internal form of a paraboloid of revolution, and hence "provides a Coriolis parameter which varies with latitude and a free liquid surface which is accessible for the application of wind stress, heat, light and tracer materials." The limits on scale and degree of similarity and the limits on scale imposed by the diameter and focal length of the paraboloid are analyzed. In experiments carried out with this apparatus, the author has reproduced "westward intensification of the primary circulations in compartments shaped like the North Atlantic and North Pacific basins. Sargasso Sea-like features and several details have also appeared, which are qualitatively like contemporary views of the major motions of the sea." *Subject Headings: 1. Wind driven currents 2. Oceanic circulation models.—I.L.D.*

5.1-205 551.556.2
Iizuka, Hajime, *On the width of windbreak*. Tokyo, Japan. *Forest Experiment Station, Bulletin*, No. 56:1-218, Dec. 1952. 139 figs., 27 plates, 57 tables, 28 refs. In Japanese; English summary p. 198-200. DWB—A most thorough empirical study of the effect of different types of windbreaks on the wind conditions at different heights and distances behind the trunks or crowns of the trees. Thickness of trunk has a greater effect in reducing wind speed to the lee, than does distance apart (of trees). Type of crown is also of prime importance. Detailed measurements made with varying wind direction relative to line of trees, wind speeds, heights, distance from trees (to 8×height) and exposure (inland or on coast), and with laboratory models in wind tunnels are given in tables and graphs and are discussed at length. Windbreaks and equipment are shown in drawing and photographs. Turbulence considerations are paramount. *Subject Headings: 1. Windbreak effectiveness 2. Turbulence behind trees 3. Micrometeorological wind profiles.—M.R.*

UPPER AIR WINDS

See also: Upper wind code (U. S. Weather Bureau), 5.1-82; Upper air circulation in low lat. in relation to certain climatic discontinuities (Frost), 5.1-133; Easterly jet streams, Australia (Bond), 5.1-136; Track jet stream by cloud formations, 5.1-138; Wind velocity profile in non-adiabatic atmos. (Ogura), 5.1-199.

5.1-206

551.557:551.510.535:621.396.1

†*Millman, George H., "A study of ionospheric winds and turbulence utilizing long radio waves." State College, Pennsylvania, Ionospheric Research, Contract No. AF19(122)-44, Scientific Report No. 37, May 30, 1952. 124 p. 55 figs., 3 tables, eqs. Also: *Annales de Géophysique*, 8(4):365-384, Oct./Dec. 1952. DWB—Author discusses briefly the dynamo theory, the tidal oscillation theory, a model of the upper circulation and the theory of wind measurements—including general equations derived for calculating ionospheric wind speeds and directions (utilizing three spaced-receivers). A method for determining the height of these winds is presented and evidence indicating diurnal and seasonal variations of the movement of upper atmospheric winds is given. Data from July 1951 through March 1952 are statistically analyzed and compared with theoretical postulates. A survey of the problem of fading is included. The 150 Kc/s equipment used is described in detail. Suggestions are made as to further data analysis to study the existence of lunar and solar tidal effects on ionospheric wind movements. Simultaneous short and long wave measurements of winds should be made. (Same item as 4F-109, June 1953, MAB.) Subject Headings: 1. Ionospheric winds 2. Long wave propagation.—W.N.

5.1-207

551.557:551.542.1

Neiburger, Morris; Sherman, Leon; Kellogg, William Welch and Gustafson, A. F. On the computation of wind from pressure data. *Journal of Meteorology*, 5(3):87-92, June 1948. 4 figs., 3 tables, 4 refs., 9 eqs. DWB—From a statistical analysis of geostrophic- and gradient-wind computations for all stations reporting winds on two 700-mb charts, it is shown that there is a variability of about 25 percent in the computations by different individuals, and that the computed values differed by about 35 percent from the observed wind speed on the average. The percentual deviation was smaller for strong winds. The gradient wind computed using approximate trajectory curvature was only slightly better than the geostrophic, and using contour curvature it was worse. The geostrophic wind thus appears to be the best approximation which can be computed from the pressure field alone. Theoretical expressions for the deviations of the computed from the observed speeds and velocities are derived. These show that the gradient speed is always greater than the true speed. The gradient speed is shown to be a better approximation than the geostrophic for most cases, but for some cases of curved cross-isobaric flow the geostrophic speed is closer to the true speed. The vector deviation of the gradient wind is, of course, larger than the scalar for cross-isobaric flow. Subject Headings: 1. Geostrophic winds 2. Gradient winds.—Author's abstract.

5.1-208

551.557 551.515.127(73)

§*Riehl, Herbert and Teweles, Sidney, Jr., A further study on the relation between the jet stream and cyclone formation. *Tellus*, 5(1):66-79, Feb. 1953. 10 figs., tables, refs. MH-BH—Events at sea level and aloft over the U. S. are related to the approach of a speed maximum in the jet stream. In the left hand portion of the area downstream from the jet maximum where air at the jet level is decelerated, frontogenesis, cyclogenesis and spread of precipitation occur. Other indications of high level divergence to the left of the advancing jet maximum are given by changes in the structure of a nearby cold dome. Insofar as the changes in the cold dome are precedent, they constitute a means of forecasting cyclogenesis. An example for the period 12-14 Nov. 1951 is analyzed synoptically and well-illustrated with cross section, wind profile, 500 and 300 mb contour and height changes and surface charts. (Same item as 4G-127, July 1953, MAB.) Subject Headings: 1. Jet stream analysis 2. Synoptic aerological studies 3. Cyclogenesis 4. United States.—Partly from author's abstract.—M.R.

VERTICAL MOTION

See also: Mountain and lee wave forecasting (Scorer), 5.1-91; Iridescent wavelike clouds (Barrington, Wilkins), 5.1-303.

5.1-209

551.558.1

Scorer, R. S., **Waves across the Irish Sea.** *Gliding*, London, 4(1):24-25, Spring 1953. diagrs., photos. Slater, A. E., **More Irish sea wave clouds.** *Ibid.*, 26-27. diagrs. Sanders, A. J., **Waves from Ulster to Kent.** *Ibid.*, 27-28. DWB—Cloud formations over the Irish Sea observed from the ground or in flight, and indicating the existence of thermal waves, are discussed and shown in photographs. Atmospheric conditions prevailing during wave formation are described. A case in which up to a hundred consecutive waves could be observed is reported. *Subject Headings:* 1. Thermals 2. Cloud formations 4. Irish Sea. I. Slater, A. E. II. Sanders, A. A. J.—G.T.

5.1-210

551.558.1:797.5

Swinn, R. (*Egyptian Gliding School*), **Standing waves over the Pyramids.** *Gliding*, London, 4(1):4-6, Spring 1953. DWB—The author interprets the pyramid waves as part of two long chains of waves on either side of the Nile Valley, marking the temperature difference between the cultivated and the desert regions. Roll clouds are characteristic of these waves. A flight up to 5200 ft (top of the wave lift) is described. Two cloud photographs are presented. *Subject Headings:* 1. Standing waves 2. Gliding 3. Cloud formations 4. Nile Valley, Egypt.—G.T.

5.1-211

551.558.21:629.13

*Jenkins, C. F., **Forecasting the mountain wave.** *U. S. Air Force. Cambridge Research Center, Air Force Surveys in Geophysics*, No. 15, Sept. 1952. 32 p. figs. DWB—Paper deals with one of the most dangerous of flight conditions. Discussion based on extensive observations in the Sierra Nevada Mountains, made mainly from sailplanes. A cross section of the air flow over mountain ridges is discussed. The characteristic cloud forms are: 1) the föhn wall, which hides the mountains and is connected with downdrafts up to 5000 ft/min; 2) the rotor cloud in the lee, with strong updrafts and severe turbulence; 3) lenticular clouds above the rotor; 4) mother of pearl clouds at a height of 25 km. Under dry conditions, no clouds exist, but the danger still remains. Tips on flying the wave are given. A number of mean and single characteristic synoptic charts and wind and temperature profiles are presented in order to show the possibilities of forecasting. The most favorable condition is the approach of a cold front and/or a trough aloft from west or northwest. A wind speed of 25 knots or more, normal to the range line at mountain top level is necessary for a well developed wave, as well as a stable state of the air below 600 mb during the approach of the trough. *Subject Headings:* 1. Mountain meteorology 2. Sierra wave 3. Aeronautical meteorology 4. Orographic turbulence 5. Sierra Nevada Mountains.—A.A.

AQUEOUS VAPOR AND HYDROMETEORS

EVAPORATION AND EVAPOTRANSPIRATION

See also: Capillary collector for measuring water drops . . . (Vonnegut), 62; Water vapor transport project (Benton), 5.11-122.

5.1-212

551.571.3:551.576.12

Ayer, H. S. (*U. S. W.B., Olympia, Wash.*), **Dewpoint variations under stratus conditions in Western Washington.** [1952?] 2 p. 2 figs. Mimeo. DWB—A study was made of 6 cases of stratus in the region between the Pacific Coast and the Cascade foothills, between June and Sept. 1951. The dew points at Tatoosh Island, North Head and Seattle-Tacoma Airport, Wash. at 4 p.m. were correlated and it was found that the inland (Seattle) dew point

ran about 2° lower and in periods of change lagged 6-12 hrs behind those at the 2 coastal stations. Furthermore, daily weather charts showed a good correlation between direction of flow and dew point, inland-flow from the S-SW giving dew points in middle, or high 50°'s, and from W-NW dew points in low 50°'s or high 40°'s. This is shown to be in keeping with sea surface temperatures off shore. *Subject Headings: 1. Dew point variations 2. Stratus effects: 3. Western Washington. I. U. S. Weather Bureau.—M.R.*

5.1-213

551.571.3:656.611

McClimont, W., Moisture damage to cargoes. A paper read before the North East Coast Institution of Engineers and Shipbuilders in Newcastle upon Tyne on the 7th March, 1952, with the discussion and correspondence upon it, and the author's reply thereto. *North East Coast Institution of Engineers and Shipbuilders, London, Transactions*, 68:249-270, D107-D120, 1952. 13 figs., table, refs. p. 259; refs. in D section. Abstracted from reprint. DWB—The author points out that "landing condition" of storage atmosphere are based upon a consideration of temperature and moisture in the hold in relation to the properties of the material of the cargo. Examples of temperature and moisture transfer between cargo and outside atmosphere are presented. The extent and prevalence of environmental damage to cargo resulting from temperature and moisture transfer and the properties of hygroscopic cargoes such as natural textile fibers, rice and fresh fruits are summarized. An extensive discussion of this paper is appended and graphs showing variations in day temperature during voyages, effect of atmospheric dew point and moisture exchange between tobacco and ventilation, and moisture equilibrium of various cargoes are included. *Subject Headings: 1. Ship climates 2. Moisture damage 3. Damage to cargoes.—I.L.D.*

5.1-214

551.573:551.579(43)

Reichel, Eberhard (*Munich*), Die Zunahme der Verdunstung als eine Ursache des Wassermangels. [Increase in evapotranspiration as a cause of the water-deficiency.] *Die Wasserwirtschaft*, Stuttgart, 43(5):123-126, Feb. 1953. 5 tables, 9 refs. DLC—Starting with 1946, decreasing runoff in German rivers was observed. The author shows that summer and winter precipitation in 1946-1951 was nearly normal, but the (annual) temperature was 0.8° higher. The resulting increase in evapotranspiration was computed according to WUNDT, THORNTWHAITE, BERGSTEN, FISCHER and KELLER and found to be 25-30 [mm/annum °C]. *Subject Headings: 1. Evapotranspiration effects 2. Runoff decrease 3. Germany.—A.A.*

5.1-215

551.573:631.6:677

Salakhov, F. S. and Korobkin, S. F., Oroshenie khlopchatnika dozhdevaniem v zapadnykh rayonakh Azerbaidzhanskoï SSR. [Irrigation of cotton plants by sprinkling in the western regions of Azerbaidzhan SSR.] *Gidrotekhnika i Melioratsiia*, Moscow, No. 4:12-19, 1952. 3 figs., 5 tables. DLC—Transpiration of cotton studied in relation to saturation deficit, green mass and method of irrigation. Sprinkling is far more economical and favorable than other irrigation methods. *Subject Headings: 1. Transpiration 2. Sprinkling 3. Irrigation 4. Cotton.—A.A.*

5.1-216

551.573:631.67

Thornthwaite, Charles W. (*Seabrook, N. J.*), Climate and scientific irrigation in New Jersey. Seabrook, N. J., Johns Hopkins Univ. Laboratory of Climatology, Jan. 1953. 15 p. DWB—Methods used in the past for determining necessity for irrigation (such as observing plants or the soil) are found inadequate and have been replaced at Seabrook by regular evapotranspiration measurements which make it possible to determine exact amount of hidden drought. The vast possibilities of multiplying agricultural production and extending it to presently non-arable regions (like Southern New Jersey) by means of irrigation, are depicted in persuasive terms. The lecture was prepared for presentation at a luncheon conference of the 38th New Jersey State agricultural convention held at Trenton on Jan. 27, 1953. *Subject Headings: 1. Evapotranspiration 2. Irrigation 3. Seabrook, N. J.—G.T.*

CONDENSATION NUCLEI

See also: Anomalous loss of condensation nuclei (Nolan, Kenny), 5.1-25; Comparison of 3 multicylinder icing meters (Howell), 5.1-67.

5.1-217

551.574.1

Grabovskii, P. I. (*Leningrad*), O proiskhozhdenii atmosferykh iader kondesatsii. [The origin of atmospheric condensation nuclei.] *Priroda*, Moscow, No. 1:89-91, Jan. 1953. refs. Hungarian trans. in: *Időjárás*, 57(1):32-34, Jan./Feb. 1953. DLC—Popular review. Author made a critical survey of hypotheses on the origin of condensation nuclei and found that the most important cause may be sea water spraying into the air. Transfer of chloride ions into the atmosphere by spraying at least $15 \cdot 10^9$ tons per annum. Back transfer by precipitation in form of condensation nuclei only $1.4 \cdot 10^9$ tons. Water loss of oceans by spraying is about 1% of the loss by evaporation. *Subject Headings*: 1. Condensation nuclei 2. Salt nuclei 3. Salt spray. I. Gelléri, Sándor (trans.).—A.A.

5.1-218

551.574.1:548

Wylie, R. G., The condensation of a vapour at a crystalline surface. *Australian Journal of Scientific Research, Ser. A, Physical Sciences*, 5(4):628-646, Dec. 1952. fig., table, 24 refs., 1 eqs. MH-BH—The theory of self-nucleation in a supersaturated vapour has been developed with considerable success by BECKER and DÖRING (1935), but little attention has hitherto been given to condensation at a solid surface. A theory is given for the nucleation of liquid condensates on a plane surface and at lines and corners formed by the intersection of plane surfaces. It is suggested that the line and corner sites are representative of typical features of real crystalline surfaces. The equilibrium properties and free energies of formation of embryos at these sites, which are required for the nucleation theory, have been given in the previous paper. The theory shows that the supersaturation for which nucleation proceeds at a just observable rate on a plane surface increases rapidly as the contact angle increases from zero. Unless an edge free energy is introduced, no supersaturation is necessary for nucleation at a line or corner of intersection of plane surfaces when the contact angle is less than a threshold value which depends on the angles between the planes. As the contact angle increases above the threshold value the supersaturation required for observable condensation increases considerably. The effect of contamination of the substrate surface is considered and the suggestions are made that, if a small amount of soluble contamination is present it is likely to become localized at surface steps and corners, sensitizing them as nucleation sites, and that microscopic observation of incipient condensation on solid surfaces may provide a tool for the investigation of surface structure. *Subject Heading*: 1. Condensation nuclei.—Author's abstract.

5.1-219

551.574.1:551.586:615.8

*Zenker, H., Messungen des Kerngehaltes der Luft in Heringsdorf/Usedom. Ein Beitrag zur lufthygienischen Überprüfung der Kur- und Erholungsgebiete. [Measurements of nuclei content of the air in Heringsdorf. A contribution to the examination of atmospheric hygiene in health resorts and convalescent places.] *Angewandte Meteorologie*, 1(10):304-313, June 1953. 8 figs., 8 tables, 14 refs. MH-BH—Heringsdorf is on NE coast of island of Usedom in the Baltic (salinity 5%). Nuclei counts were made on a pier, the beach, a park in the town 60 m inland, and a pinewood. These show characteristic differences. Histograms and nuclei wind roses show numbers of nuclei in winds from different directions and at different seasons; on the beach and pier winds off the sea are much the cleanest and healthiest; such winds are most frequent March-June. The wood also has cleaner air than the town. *Subject Headings*: 1. Nuclei count 2. Balneology 3. Medical climatology 4. Usedom, Baltic Sea.—E.P.B.

5.1-220

551.574.42

Mason, B. J. (*Imperial Coll., London*) and Owston, P. G. (*Univ. Coll., London*), Ice crystals in spiral form grown from the vapor. *Philosophical Magazine*, 7th Ser., 43(343):911-912, Aug. 1952. ref. DWB—Some unusual ice crystals were formed on cooling pipes in a cold

chamber after $3\frac{1}{2}$ years of growth at a constant air temperature -10°C . They were similar to the "crevasse hoar" described by SELIGMAN in "Snow structure and ski fields," p. 73, London, 1936. The spiral form is attributed to an incomplete hexagonal edge in an initial formation, probably arising from some obstruction connected with the rapport in which the crystal grew. *Subject Headings: 1. Spiral ice crystals 2. Hoar frost formation.—M.R.*

FOG

See also: Objective system of estimating fog and stratus (Gringorten), 5.1-86; Unusual temp. during fog (Gold), 5.1-180.

5.1-221

551.575:634

†Byers, Horace R. (*Dept. of Met., Chicago Univ.*), **Coast redwoods and fog drip.** *Ecology*, Brooklyn, N. Y., 34(1):192-193, Jan. 1953. 12 refs. Abstracted from reprint. **DWB**—Contrary to the prevailing notion that California redwoods thrive on fog drip in summer (CANNON—1901), the author gives meteorological, orographical and ecological evidence to support his observation that the California redwood groves are located in coastal valleys where fog drip seldom occurs. Douglas fir, or Monterey cypress and pine, may be found where the fog (which is really stratus at 800 to 1200 ft and seldom lower than 300 ft above the valleys) drip is heavy, but redwoods occur in the lower lying areas where stratus is not a wet fog but a dry cloud canopy or even breaks away due to orographic effects. *Subject Headings: 1. California stratus 2. Fog drip 3. Redwood trees.—M.R.*

5.1-222

551.575:551.463

*Hakodate Marine Observatory, **Report on the marine observation for sea fog in 1951.** *Journal of Meteorological Research*, Tokyo, v. 4, Suppl. No., p. 81-120, March 1952. 9 figs., tables. In Japanese; English summary p. 326-327. **MH-BH**—This memoir, illustrated by numerous graphs and diagrams, summarizes results of an expedition from June 14-July 5 near 42°N , $140-145^{\circ}\text{E}$. Contents: Introduction, by Y. TAKENOCHI; Marine meteorological and fog observations, by Y. FUJII and M. TSUKAGOSHI (frequent hourly observations of wind, air and sea temperature, R.H. and visibility); Oceanographic observations (temperature and chlorinity at 0, 25 and 50 m) by M. TORII; Aspiration resistance thermometer, by M. NAKAIIMA; Vertical temperature distribution heights 0.5-10.5 m, by M. NAKAIIMA, M. TORII and S. TAKINAMI; Marine hot-wire anemometer for turbulence, by M. NAKAIIMA and T. KUWATA; Wave analyzer for turbulence, by T. KUWATA; Turbulent air flow above the sea, and its relation to fog dissipation and stability of lowest layer, by Y. TAKENOCHI; Drop size distribution of sea fog, by Y. FUJII and S. TAKINAMI; Water content of sea fog and its relation to visibility, by Y. TAKENOCHI and H. KATSUURA; and Dissolved substances (mainly Cl) in sea fog compared with sea water, by Y. TAKENOCHI and J. IZUKA. *Subject Headings: 1. Sea fog 2. Japan.—C.E.P.B.*

5.1-223

551.575.1

Best, A. C. (*Met. Office, London*), **The relative humidity in radiation fog.** *Tellus*, 5(1):32-35, Feb. 1952. table, 3 refs., 9 eqs. **MH-BH**—An equation is derived for the variation of relative humidity in the presence of a given number of fog droplets and with a steadily falling temperature. Although there is no explicit solution it is shown that there is an upper boundary to the relative humidity, depending on mass of nucleus, rate of fall of temperature and ambient temperature. A table shows some numerical values for this upper boundary at 288° and 278°A , for different rates of fall of temperature and for 10,100 and 1000 drops/cm³. Temperature has a very small effect on the upper limit of relative humidity (H_b). H_b increases with rate of fall of temperature (α) and decreases as N (number of drops) increases. It is concluded that with ordinary salt concentrations and rates of fall of temperature, the relative humidity in radiation fog should not exceed 100.1%. *Subject Headings: 1. Radiation fog 2. Supersaturation in fog.—M.R.*

5.1-224

551.575.1

Fleagle, Robert G., **A theory of fog formation.** *Journal of Marine Research*, 12(1):43-50, 1953. 2 figs., 5 refs., 11 eqs. Also: *Washington. University. Dept. of Meteorology and*

limatology. Contribution No. 10. DWB—The theory of radiative temperature change above a cold and a warm water surface is reviewed and applied to the case of cold air flowing over warm water and warm air over cold water. It is shown that over cold water the air immediately above the surface would be warmed from the radiation coming from the warmer air above, so fog could not form in that shallow surface layer, but above that the air would be cooled and fog would form. For the opposite case, the air would be cooled from above in the first meter or so, but warmed above the surface layer; hence, fog could form at the surface, but would have a definite upper boundary. Observations made with thermocouples on a 4 m mast above a fresh water lake in the San Juan Islands and over a cold current, agree with the theory (Aug. 19 and Aug. 26, 1952, respectively). *Subject Headings: 1. Fog formation 2. Radiative balance over water surfaces 3. Radiation fog.*—*M.R.*

CLOUDS

See also: Cloudiness and choice of astronomical sites (Jones), 5.1-63; Track jet stream by cloud formations, 5.1-138; Dew point variations under stratus (Ayer), 5.1-212.

5.1-225

551.576

Galligan, Agnes M., *Variability of subjective cloud observations, I. U. S. Air Force. Cambridge Research Center, Air Force Surveys in Geophysics, No. 33, March 1953. 13 p. 4 figs., 5 tables. Also: U. S. Air Force. Cambridge Research Center, AFCRC Technical Report, 53-10. DWB*—Cloud amount and height observations were obtained from a group of Air Force observers to estimate the variability which can be expected from subjective observations. Considerable variation was evident in the observational data obtained. Mean cloud amounts for each day are given with their standard deviation and range. The variability was greater in the middle range of cloud amount—i.e., around 5/10—and decreased as the cloud amount approached 0/10 and 10/10. Cloud heights demonstrated wide variations and the distributions were irregular. The mean cloud heights are presented with the range of the middle 50% of the observations. The lack of agreement in the type of sky cover observed is also clearly indicated. It appears that the subjective observations of this study could not be made to the degree of accuracy requested. *Subject Headings: 1. Cloud observations 2. Cloud height.*—*Author's abstract.*

5.1-226

551.576:77

Schaefer, Vincent (*Tech. Adv., Munitalp Foundation, Inc.*), *Cloud photography project. Weatherwise, 6(3):72-73, 85, June 1953. photo. MH-BH*—A continuing program for photography of special cloud formations at 10 or more forest lookout stations in the West, under the sponsorship of the Munitalp Foundation, Inc. and the direct supervision of the author and JACK BARROWS of the U. S. Forest Service is described. Other projects consist of studies of jet stream clouds and the equipping of a mobile weather observatory at the University of Washington under the direction of DR. P. E. CHURCH. Time lapse pictures of clouds are also to be made in Sweden, the Bahamas and at a mountain observatory in Peru. *Subject Headings: 1. Cloud moving picture photography 2. Jet stream cloud formations 3. Mobile weather stations. I. Church, P. E. II. Munitalp Foundation, Inc.*—*M.R.*

5.1-227

551.576.11:629.13

Appleman, H. (*Hqs., Air Weather Service, Wash., D. C.*), *The formation of exhaust condensation trails by jet craft. American Meteorological Society, Bulletin, 34(1):14-20, Jan. 1953. 4 figs., 2 tables, 13 refs. MH-BH*—The critical temperature for the formation of a saturated wake is studied as a function of the moisture and heat added from the aircraft to the air, the mixing ratio and the temperature, humidity and pressure of the environment air. The necessary conditions for the formation of visible trails or "negative contrails" can be directly derived from constructed curves, applicable to any jet aircraft with a normal water to heat ratio in its exhaust. The author assumes that contrails are composed of ice crystals, going first through an intermediate state of saturation with respect to water. Minimum visible water content is 0.004 gm m^{-3} (0.01 gm m^{-3} for a distinct trail). *Subject Headings: 1. Exhaust trails 2. Condensation trails 3. Jet aircraft.*—*A.A.*

5.1-228

551.576.2:523.78(488

Lindholm, F. (*Swedish Met. and Hydrological Inst.*), **Expectancy of clear days in the Central Zone of the total eclipse of the sun June 30, 1954, in Sweden.** *Tellus*, 5(1):101-100 Feb. 1953. 2 figs., 3 tables, 4 refs. **MH-BH**—The occurrence of the total solar eclipse 1954, visible in southern Sweden, has raised the question regarding the cloudiness condition which may be expected in this part of the country at the time of the eclipse. A detailed investigation of the average sunshine conditions at Swedish stations situated along the track of the totality has therefore been made. From this is concluded that the coastal regions are decidedly more favorable than the inland. A comparison between the western and eastern coasts leads to the conclusion that the average cloudiness at 15h, the hour of observation nearest the totality, is slightly higher on the West coast than at locations on northern Öland and southern Gotland. Regarding the number of clear sky days at different places the coasts are also more favorable even than the inland, and of those the northern part of Öland seems to be considerably more favorable even than the outer part of the West coast. The statistics refer to observations at 14h June 20–July 10 in the years 1931–1950. *Subject Headings:* 1. Solar eclipses 2. Cloudiness 3. Sweden.—*Author's abstract.*

5.1-229

551.576.36:551.576.4

Arnold, George L. (*Wash., D. C.*), **A relation between frequencies of cloud cover and cloud height.** *American Geophysical Union, Transactions*, 34(2):189–193, April 1953. 4 figs., 3 refs. **MH-BH**—A method of relating the frequency of six tenths or more sky cover to the frequency of various ceiling heights is presented to show how the latter may be estimated in areas where only total sky cover has been observed and recorded. Tests show that the method has significant value above 1000 ft. *Subject Headings:* 1. Cloud frequencies 2. Ceiling height estimates 3. Climagrams.—*Author's abstract.*

PRECIPITATION

See also: **Precip. measurements on a slope** (Grunow), 5.1-26; **Accuracy of determination of annual precip.** (Sanderson, Johnstone), 5.1-27; **Evaluation of cloud seeding** (Howell, W. E. Assoc.), 5.1-97; **Composition of atmos. precip.** (Eriksson), 5.1-103; **Dry atmos. fronts, S. Ukrainian steppes** (Mishutin), 5.1-151; **Iowa weather, 1953** (Barger), 5.1-174; **Relation between soil and wind erosion** (Kiselev), 5.1-202; **Precip. in Europe at max. of last ice age** (Klein), 5.1-276; **Effect of day-to-day solar variations on weather** (Mauchly), 5.1-297.

5.1-230

551.577

Dietrich, Sigismond de R., **Rainfall in Miami, Florida 1914–1951.** *Association of American Geographers, Annals*, 43(2):166–167, June 1953. **DWB**—Miami is more often subject to inadequate rainfall than not, owing to distribution and variability of rainfall and to edaphic and topographic conditions. Hurricanes exert little influence either upon the mean annual amount of precipitation or upon the fall maximum of precipitation. Thunderstorms are the principal source of Miami's rainfall. *Subject Headings:* 1. Precipitation variations 2. Thunderstorm rainfall 3. Miami, Florida.—*I.L.D.*

5.1-231

551.577:551.508.85

*†Hudson, H. E., Jr., Stout, G. E. and Huff, F. A. (*Ill. State Water Survey, Engineering Subdiv.*), **Rainfall studies using rain-gage networks and radar.** *American Society of Civil Engineers, Proceedings*, v. 79, Separate, No. 178, March 1953. 26 p. 15 figs., 2 tables, refs., 4 eqs. **DWB**—The results of three years' work on concentrated rain-gage networks and on measurements of rainfall extent and intensity by means of radar are described. Thunderstorm rainfall is shown to be multicellular, so that the application of area-depth data is more complex than is usually assumed. The orientation, duration, and path of storm cells are shown to have marked effects on area-depth curves for a given basin. Data on area-depth relationships are presented for networks having areas of 5.2 sq miles, 95 sq miles, and 280 sq miles. The effects of gage density on mean rainfall errors are investigated. The heaviest storms were found to be associated with cold fronts. The theory and development of radar

rainfall measurement are reviewed. Available methods of measuring rainfall by radar are discussed. Data collected in the study on radar signal strength and rainfall intensity are presented and analyzed using a new analytical approach. It is concluded that radar is able to depict rainfall extent better than rain gaging, and that radar can measure rainfall intensities as well as do the rain-gage networks generally used. *Subject Headings: 1. Radar rainfall measurement 2. Rain gage networks 3. Rainfall data.*—*Authors' abstract.*

5.1-232

551.577(438) 551.579.4(438)

*Poland. Państwowy Instytut Hydrologiczno-Meteorologiczny, *Wisła i rzeki przymorza wschód od Wisły*. [The Vistula and the rivers on the Baltic Coast.] Poland. Państwowy Instytut Hydrologiczno-Meteorologiczny, *Rocznik Hydrograficzny*, 1945. Pub. 1950. 90 p. s., mostly tables. In Polish; legends in Polish and French. DWB—Besides the voluminous water level data for rivers of Poland, the mean monthly precipitation for 1945, for 1933/37 and ratio of 1945 to 1933/37 are given for 8 river basins of Poland and the results analyzed (page 89). The same is done for water level readings on 15 basins, and the 1945 levels plotted on a graph for each basin; periods when each river was covered with ice at several stations are shown graphically for winter 1944/45. A large chart shows location of rivers and river gaging stations. *Subject Headings: 1. Precipitation data 2. River stages 3. River ice 4. Poland.*—*M.R.*

5.1-233

551.577(494)

*Uttinger, Heinrich, *Die Niederschlagsmengen in der Schweiz, 1901-1940*. Beilage, *Niederschlagskarte der Schweiz*. [Precipitation in Switzerland, 1901-40. Suppl. in pocket, rainfall map of Switzerland.] Zurich, Verlag des Schweizerischen Wasserwirtschaftsverbandes, 1949. 27 p. mostly tables, 18 refs. In French and German. DLC—The mean monthly and annual precipitation has been calculated for 484 stations in Switzerland for the period 1901-1940, and presented in table I. Table II gives the mean annual precipitation for 107 other stations and 142 recording gages. Table III gives the highest and lowest annual total precipitation (for 1901-40) at 347 stations. The data are arranged by regions or river basins, and are used to construct a large colored isohyetal chart for Switzerland. The probable error of the means, the variability from year to year and from place to place are discussed. The isohyetal chart shows zones of 60, 60-80 . . . 280-320, and 320 annual precipitation, and is based on data for 733 stations. Previous isohyetal charts (French, German, Swiss and Italian) were consulted in drawing this. (For similar work on S. Switzerland see item 10-128, Oct. 1950, *MAB*.) *Subject Headings: 1. Precipitation data 2. Isohyetal charts 3. Switzerland. I. Switzerland. Meteorologische Zentralanstalt.*—*M.R.*

5.1-234

551.577.11:551.510.41

Ångström, Anders, and Högberg, Linus (*Swedish Met. and Hydrological Inst., Stockholm*), *On the content of nitrogen in atmospheric precipitation in Sweden*. II. *Tellus*, 4(4):271-279, Nov. 1952. 5 figs., 6 tables, 5 refs., 5 eqs. MH-BH—On the basis of the previously developed equation, $S = \alpha \log(1 + P)$ in which S is the quantity of nitrogen transferred through the precipitation P and α is an arbitrary constant denoting the nitrogen concentration at the beginning of precipitation, the author has computed $\alpha \text{NH}_4\text{-N}$ and the total amount of $\text{NH}_4\text{-N}$ kg/ha for the different seasons and for the year for various parts of Sweden. Maps showing the geographical distribution of annual amount of NH_4 in precipitation and the geographical distribution of the average values of α for the year are given. It is suggested that the concentration of fixed nitrogen in precipitation is the result of a photochemical process which explains the almost constant ratio between $\text{NH}_4\text{-N}$ and $\text{NO}_4\text{-N}$ found frequently in the temperate zone. *Subject Headings: 1. Nitrogen content of precipitation 2. Precipitation analysis 3. Sweden.*—*I.L.D.*

5.1-235

551.577.2(86)

*Schmidt, R. D., *Die Niederschlagsverteilung im andinen Kolumbien*. [Precipitation distribution in Andean Colombia.] *Bonner Geographische Abhandlungen*, Bonn, No. 9:99-119, 1952. diagr. and map in text, 5 maps and table in pocket, bibliog. p. 118-119. DWB—On the basis of data from rainfall stations and descriptions of vegetation and landscape, the

author constructed charts showing mean annual precipitation, mean monthly precipitation for Feb., May, July and Oct., the annual march of precipitation and regions with equal seasonal precipitation for the Andean region of western Colombia. Eight precipitation regions have been established. These are: the northern trade wind region, the eastern lowlands region, the Cordillera of Bogotá, the basin of the upper Magdalena, the mountain region of Medellín, the basin of the upper Cauca and the Pacific region. The rainfall characteristics of each region and the effect of rainfall upon vegetation and the relationship between rainfall and relief, namely, the altitude of the zone of maximum precipitation and the drought valleys are discussed. A table giving mean monthly precipitation for 123 stations is included. *Subject Headings*: 1. Precipitation distribution 2. Precipitation data 3. Western Colombia.—*I.L.D.*

5.1-236

551.577.2:551.579.4:626.8

§Jens, Stifel W. (*St. Louis, Mo.*), **Engineering meteorology.** *Illinois. State Water Survey Div., Bulletin*, No. 41:99-116, 1952. DWB—An excellent presentation of the current interpretation, techniques and usefulness of precipitation data as applied to hydrologic engineering. The desirability of widened meteorological knowledge is stressed. In the discussion hydrometeorology is shown as a link between engineering and meteorology. *Subject Headings*: 1. Precipitation data 2. Hydrometeorology 3. Engineering meteorology.—*W.N.*

5.1-237

551.577.33 (675)

551.577.61 (675):635.4

*Monti, J. R. (*Comp. du Congo pour le Commerce et l'Industrie*), **La périodicité des pluies au Mayumbe et leur relation avec la production de cacao.** [Periodicity of rainfall in Mayoumba and the relation of rainfall to cacao production.] *Belgium. Direction Générale de l'Agriculture, Bulletin Agricole du Congo Belge*, 44(3):493-510, June 1953. 5 tables, graphs, refs. Dutch summary p. 510. DWB—Monthly rainfall amounts at Ganda-Sundi are tabulated for each year from 1909 to 1952. An analysis of annual totals reveals a 4-year periodicity up to 1927 but no definite relationship can be established after that date. A graphical comparison shows a definite relationship between rainfall amount and cacao production. Data on rainfall amounts at Temvo (1915-1949) are appended. They confirm the existence of a 4-year periodicity and of the effect of rainfall on cacao crops. *Subject Headings*: 1. Rainfall periodicities 2. Rainfall effects 3. Cacao production 4. Mayoumba, Belgian Congo.—*G.T.*

5.1-238

551.577.36

Stidd, C. K. (*U. S. W. B., Wash., D. C.*), **Cube-root-normal precipitation distributions.** *American Geophysical Union, Transactions*, 34(1):31-35, Feb. 1952. 5 figs., 8 refs. MH-BH—The integral of the rainfall histogram for almost every place and duration can be plotted as a straight line using a normal probability abscissa and the cube root of the rainfall amount as ordinate. Zero rainfall must be counted. Method tested for extreme climatic conditions. Rainfall climate of a single place (example Hilo, Hawaii) can be described by a family of graphs showing rainfall vs. probability for periods of various length. *Subject Headings*: 1. Rainfall frequency distribution 2. Statistical techniques 3. Hilo, Hawaii.—*A.A.*

SNOW

See also: **Elect. properties of blizzards** (Barré), 5.1-2; **Report of Committee on Snow, 1950-51** (Garstka and others), 5.1-28; **Coop. Snow Investigations program** (Rhodes, Wilson), 5.1-29; **Snow and skiing** (Villeneuve), 5.1-30; **Surface temp. of soil under grass with snow cover** (De Backer), 5.1-183.

5.1-239

551.578.4:536.2:551.501

Yosida, Zyungo and Iwai, Yutaka, **Measurement of thermal conductivity of a mass of snow.** *Teion Kagaku [Low Temperature Science]*, Sapporo, Japan, 3:79-87, 1950. 5 figs., table, 3 refs. In Japanese; English summary p. 87. DWB—The authors devised a method of measuring the thermal conductivity of snow without inserting any thermometer into the sample. A mass of snow is put in an airtight vessel with double wall. A thin tube of glass, which pierces the wall of the vessel, leads the pressure of air included among the snow to a U-tube oil-manometer. The pressure measured with this manometer gives the mean temperature of the air which is

the same as the mean temperature of the snow in the vessel. By circulation of a water solution of ethyleneglycol, the temperature of the wall is kept at about 1°C for a considerable time and then is changed suddenly to about -6°C by circulation of another solution at that temperature. The pressure on the manometer decreases gradually. Plotting the logarithm of the values of pressure against time, we can calculate the thermal diffusivity of the snow. The product of the density p , specific heat and thermal diffusivity give the thermal conductivity μ . The authors obtained a simple empirical relation between μ and p . $\text{Log}_{10} \mu = -4 + 2P$ (μ in $10^{-4} \text{ cal./}^{\circ}\text{C. cm. sec.}$; P in gr/cm^2). **Subject Headings:** 1. Snow physics 2. Thermal conductivity of snow.—*Authors' abstract.*

5.1-240

551.578.4:551.501

Yosida, Zyungo and Kuroiwa, Daisuke, **Sublimation in the interior of snow layer.** *Teion Kagaku [Low Temperature Science]*, Sapporo, Japan, v. 3:89-100, 1950. 7 figs., In Japanese; English summary p. 100. DWB—Four cages, which were made of wire gauze and contained a mass of snow in each of them, were buried in the interior of snow layer (thickness: 1.8 cm.) at various heights from the ground surface. The weights of cages were measured every day. Increase or decrease of weight means respectively condensation of water vapor into or evaporation of it from the snow by sublimation. Water vapor evaporated in the neighborhood of the ground surface and condensed on the snow in the upper part of the snow layer. By such sublimation heat was conveyed from the lower part of the snow layer to the upper part. The quantity of heat thus conveyed was calculated and it was found to be as large as the quantity of heat conveyed by thermal conduction. The diffusion of water vapor through a mass of snow was determined by experimental measurements. The bottom of a small can (diameter: 5 cm., height: 3.5 cm.) was taken off and a wire gauze was stretched in its place. Four such cans were piled up and the upper and lower ends of the pile were maintained at the temperatures -1°C and -6°C , respectively, for several hours. Water vapor evaporated from the snow put in the cans and diffused downwards. Diffusion coefficient of the water vapor was calculated from the amount of decrease in the weight of snow in each can and was found to be 3-4 times greater than that through free air. It was supposed that evaporation and condensation of water vapor occurring at the opposite surfaces of a pairs of neighboring ice grains in the snow caused this increase of diffusion coefficient. **Subject Headings:** 1. Snow physics 2. Sublimation of snow.—*Authors' abstract.*

5.1-241

551.578.46:531.311.12(988)

Bader, Henry, **Sorge's law of densification of snow on high polar glaciers.** *U. S. Snow, Ice and Permafrost Research Establishment, SIPRE Research Paper*, 2, [1953?] fig., 2 refs., 1 p. This paper formerly listed as *SIPRE Report* 14. DLC—SORGE assumed that for a stationary glacier, where there is no melting in summer, the snow density versus the depth below the snow surface is invariant with time. The author uses this concept in order to derive the specific velocity of densification and shows that the annual accumulation can be computed, knowing the rate of approach of two points and the density for these points. The depth-density curve itself is described by an empirical formula. A check against data obtained at Eismitte, Greenland, gave good results (average annual accumulation 314 mm water equivalent). **Subject Headings:** 1. Snow densification 2. Snow density profiles 3. Glacier nourishment 4. Eismitte, Greenland. I. Sorge, E.—A.A.

5.1-242

551.578.46:551.501

Boardman, Horace P. (*Prof. Emeritus, Univ. of Nevada*), **Snow surveys for forecasting stream flow in Western Nevada.** *Nevada. University. Agricultural Experiment Station, Bulletin*, No. 184, Sept. 1949. 120 p. 17 tables, 23 graphs., diagr. DWB—Means of snow water content and springtime runoff, reduced to 45-year normals, computed for a number of snow courses in the Truckee, Tahoe, Carson and Walker basins in the Central Sierra, as well as regression equations for April-July runoff vs. snow water content with graphical and a detailed tabular presentation of data (1922-48). The method of "weighting formulas" for the whole basin is explained. Snowmelt runoff can be forecast much better using snowcourse data than winter precipitation records. **Subject Headings:** 1. Snow surveys 2. Hydrologic forecasting 3. Nevada.—A.A.

5.1-243

551.578.46:531.794

Bowden, F. P., **Friction on snow and ice.** *Royal Society of London, Proceedings, Ser. A* 217 (1131):462-478, May 21, 1953. 10 figs., 9 tables, 14 refs. **DLC**—Experiments on friction of ski on snow and ice at different temperatures at Davos, Switzerland, confirmed that drop in friction at appreciable sliding speed is due to localized surface melting caused by frictional heating. Effect of various coatings on surface of ski were tested, the best results being given by polytetrafluoroethylene. This also gave best results on sand. The influence of the contact angle and of wetting was also investigated. *Subject Headings:* 1. Snow mechanics 2. Skiing —C.E.P.B.

5.1-244

551.578.46:621.393

Ito, H., **Investigation on the snow accretion on telegraph wires.** *Journal of Meteorological Research, Tokyo*, 4(6):251-267, Sept. 1952. 11 figs., 6 tables, 5 refs., 12 eqs. In Japanese. English summary p. (19). **MH-BH**—In view of extensive damage suffered by communication lines (statistical material presented for 10-year period, west coast of N. Honshu) the mechanism of snow accretion was investigated in 1950-51. As a result of the investigation the author presents detailed data on the amount of snow accumulated and on concurrent atmospheric phenomena, such as temperature, wind velocity, depth of snowfall, surface pressure distribution and upper air conditions. Correlations between atmospheric phenomena and snow accretion are established and integrated into formulas to be used in forecasting accretion conditions. Numerical results obtained by applying this forecasting method are compared with measured quantities of accumulated snow. *Subject Headings:* 1. Snow accumulation on wires 2. Snow damage 3. Public utilities forecasting 4. Industrial meteorology.—G.T.

5.1-245

551.578.46(52):551.501

*Kumai, Motoi and Higuchi, Keiji (*Hokkaido Univ., Sapporo*), **Measurement of the mass and number of falling snow crystals in the atmosphere.** *Meteorological Society of Japan, Journal, 2nd Ser.*, 30(11):345-355, Nov. 1952. 21 figs., 3 tables, 13 refs. In Japanese. English summary p. 345. **MH-BH**—Replicas of falling snow crystals were obtained on an ethylene dichloride solution of formvar spread over paper or glass. Some 1000 such replicas were prepared on Mt. Taisetsu, Hokkaido (at 1050 m) during the three winters 1950-1952. On the basis of 34 specimens taken on March 2, 1951, the total mass and the number of snow crystals in the snowfall are calculated. It is found to be in good agreement with the liquid water content of the cumulus cloud. *Subject Headings:* 1. Snow sampling 2. Snow crystals 3. Snow analysis 4. Mt. Taisetsu, Japan.—G.T.

5.1-246

551.578.46(238)

Lliboutry, Louis, **L'origine des pénitents de neige.** [Origin of "nieve penitente"]. *Académie des Sciences, Paris, Comptes Rendus*, 236(9):952-954, March 2, 1953. refs. **DWB**—The author's interpretation of the formation of nieve penitente and of "micropenitents" is based on his observations of temperature, dew point and state of the snow in the Santiago Andes. According to his theory sublimation is the decisive factor in the development of such fields of pinnacled snow. On a sunny day depressions in a snow field become permeated with water and reach a higher temperature than the ridges. Thus the crevices tend to deepen. As an intermediate state between a uniform snow field and "nieve penitente" the snow often shows a honeycomb pattern. *Subject Headings:* 1. Nieve penitente 2. Snow mechanics 3. Glaciers 4. Andes.—G.T.

5.1-247

551.578.46:551.311.12

Lliboutry, Louis, **Les pénitents de glace et la transformation de la neige en glace dans les Andes de Santiago.** [Ice "penitents" and the transformation of snow to ice in the Santiago Andes.] *Académie des Sciences, Paris, Comptes Rendus*, 236(11):1191-1193, March 16, 1953. refs. **DWB**—On the basis of observations made in the Santiago Andes, the author analyzes the structure and stratification of "nieve penitente." He finds that several layers of brown dust (corresponding to dry periods with strong wind) settle on penitents and glaciers every year. A considerable portion of the pinnacled snow is transformed to "ice penitents" in the

course of a year. *Subject Headings:* 1. Nieve penitente 2. Snow mechanics 3. Glacier formation 4. Andes.—G.T.

5.1-248

551.578.46:551.501.1

Parshin, V. N. and Salov, M. S., *O postanovke nabludenii nad snezhnym pokrovom v onakh polezashchitnykh lesonasazhdenii*. [Organizing snow cover observations in the vicinity of shelter belts.] *Meteorologiya i Gidrologiya*, No. 7:32-35, 1952. 6 refs. DLC—The authors show by many examples that the measurement techniques used at present for determining thickness of snow cover give incorrect results. Especially unsatisfactory results are obtained for an area with large open spaces or diverse forms of relief. Official manual issued by the State Hydrometeorological Service of the U.S.S.R. in 1950 neglected the complete observations of snow cover and provided for investigations for agricultural purposes only. A station of the measurement point by straw markers recommended in the manual can change the normal conditions of snow cover stratification. *Subject Headings:* 1. Snow cover 2. Observation techniques.—N.T.Z.

HYDROMETEOROLOGY

See also: Increase of evaporation as cause of water deficiency (Reichel), 5.1-214; Engineering met. (Jens), 5.1-236.

5.1-249

551.579:019.941

†American Geophysical Union, Southwest Pacific Regional Meeting, Stanford University, Feb. 6-7, 1953, Abstracts of papers of Sections of Hydrology and Meteorology. Stanford, 1953. 6 figs. DWB—A collection of summaries of 31 papers presented at the A.G.U. SW Pacific Reg. Meeting. The papers abstracted deal with precipitation evaluation, hydrology, snow survey and their practical applications, with atmospheric dynamics, visibility, etc. *Subject Headings:* 1. Meteorological abstracts 2. Hydrometeorology.—G.T.

5.1-250

551.579(08)

Institution of Water Engineers, London. Hydrological Research Group, **Hydrological Measurements**. (Papers prepared by the Hydrological Research Group for the Hydrological Symposium, London, Nov. 12, 1952.) *Institute of Water Engineers, London, Journal*, 7(3):178-185, May 1953. refs. Discussion and written communications p. 226-237; 267-268; 270-272. DWB—Methods and practices of hydrologic measurement (precipitation, evaporation, percolation, runoff, ground-water level and storage) in Great Britain are reviewed briefly with ample quotation of the pertinent literature. Many theoretical and practical problems are taken up in the summarized oral discussion and in the written communications which followed the delivery of the papers at their Hydrological Symposium in London on Nov. 12, 1952. *Subject Headings:* 1. Hydrologic measurements 2. Symposia. I. Institution of Water Engineers, London. Hydrological Symposium, Nov. 12, 1952.—G.T.

5.1-251

551.579.5:551.501

Baier, W., *Elektrische Methoden zur Messung der Bodenfeuchte*. [Electric methods for measurement of soil moisture.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 32:18-22, 1952. 5 figs., 10 refs. German summary p. 18. DWB—Usual methods for indirect measurement of soil moisture are compared and the studies of the author on the electric conductivity of gypsum blocks in the soil are summarized. The hygroscopic gypsum has a significant lag. The author tried a mixture of soil and 10% gypsum. Application of nylon blocks, which have a great reaction velocity, discussed but the measurement results are significantly influenced by different soil solutions. *Subject Heading:* 1. Soil moisture measurement.—A.A.

5.1-252

551.579.5:551.501

*Baier, W., *Ergebnisse von Bodenfeuchteuntersuchungen in Stuttgart-Hohenheim*. [Results of soil moisture measurements at Stuttgart-Hohenheim.] *Germany. Deutscher Wetterdienst in der US-Zone, Berichte*, No. 37, 1952. 35 p. 14 figs., 12 tables, 21 refs., append.

DWB—The soil moisture content defined as utilizable moisture was investigated at Hohenheim during the year 1949–1950. Soil samples were removed daily up to a depth of 1 m by means of a soil auger; the moisture content of 10 cm samples was determined by weighing after desiccations. This detailed and comprehensive study contains: 1) a description of the method for determining soil moisture content, and of the characteristics of the soils investigated including the position of the soil parcels, the texture, structure and structural changes in the soil in the course of the study, the water capacity, the minimum water capacity and field capacity, and hygroscopic characteristics of the soil; 2) an analysis of the climate of Hohenheim and the course of the weather during 1949/1950 and 3) absolute soil moisture in percent weight, relative soil moisture, annual course of soil moisture; soil moisture in cultivated and fallow soil, soil moisture under various crops and soil moisture balance. The climatic and soil moisture data are given in tables. *Subject Headings*: 1. Soil moisture measurement 2. Soil physics 3. Hohenheim, Germany.—*I.L.D.*

5.1–253

551.579.5:551.501

Bethlahmy, Nedavia, A method for approximating the water content of soils. *American Geophysical Union, Transactions*, Pt. 1, 33(5):699–706, Oct. 1952. figs., 8 tables, 4 refs. **MH-BH**—Describes the laboratory, field and mathematical procedures used to calibrate the fiber-glass soil moisture units employed in the experiments of 1948 in a brush covered watershed in northeastern Pennsylvania. The purpose was (1) to determine the soil-water relationships in scrub oak areas and (2) the daily changes in the storage of water in the soil mantle. A conversion table is obtained (taking into account the regression equations) for direct translation of the resistance readings into inches of water. The results of this preliminary study show that valid calibration curves are obtainable only if the original structure of the soil is maintained. *Subject Heading*: 1. Soil moisture measurement.—*W.N.*

5.1–254

551.579.5:631.4

†Isachenko, A. G., Rukovodiashchie geograficheskie idei G.N. Vysotskogo i ego vklad v geograficheskuiu teoriyu. [The leading geographical ideas of G. N. Vysotskii and his contribution to geographical theory.] *Vsesoiuznoe Geograficheskoe Obschestvo, S.S.S.R., Izvestiia*, 84(5):478–489, Sept./Oct. 1952. bibliog. p. 489. **DLC**—G. N. VYSOTSKII's principal interests were in the fields of soil science, geobotany and forestry and in their interrelationships. In his studies on the zonal distribution of soil and plants in the Soviet Union, he analyzed the relationship between soil moisture content as a result of precipitation, evaporation and soil leaching on the one hand and soil characteristics and vegetation on the other. This article gives an extensive account of VYSOTSKII's contributions to geographic theory and includes a list of his most important writings. *Subject Headings*: 1. Soil moisture 2. Soils 3. Vegetation zones 4. Geographical theory 5. Bibliographies 6. Vysotskii, G. N.—*I.L.D.*

5.1–255

551.579.5:551.501

Ivanov, P. V., Bystryi metod opredeleniia vlazhnosti pochv. [A quick method for the determination of soil moisture.] *Pochvovedenie*, Moscow, No. 3:61–65, 1953. 2 figs., 2 tables, 2 refs. **DLC**—Rapid drying of soil samples (3–5 g) for the determination of soil moisture can be achieved by burning alcohol three times directly on the sample in a small container. Alcohol consumption is 4 cm² the first time and 1.5–2.0 cm² the second and third times. The amount of burned organic matter is negligible, the accuracy very high, according to 28 tests made with parallel measurements in desiccation chambers. *Subject Heading*: 1. Soil moisture measurement.—*A.A.*

5.1–256

551.508.79:551.579.5:551.501

Kubo, J., A new method for the soil moisture measurement. *Japan. Central Meteorological Observatory, Tokyo, Memoir of Industrial Meteorology*, 16(1):37–43, Aug. 1952. 9 figs., 4 refs. In Japanese; English summary p. 3. **MH-BH**—The author developed a new apparatus for soil moisture measurement. The method used with this apparatus is that reported by A. U. MOMIN (cf. *Agricultural Meteorology*, Vol. 6, No. 1). The instrument consists of a special mercury thermometer with half the bulb wound with electrically heated wire. When the bulb in the soil is heated, the time required for attaining a constant temperature rise of

the thermometer is proportional to the soil moisture. Consequently the soil moisture can easily be determined by measuring the heating time required for a constant temperature rise of the thermometer. *Subject Headings:* 1. Soil moisture measurement 2. Soil moisture instruments.—*Author's abstract.*

5.1-257

551.579.5:63

Markkink, G. F., *Betrekkingen tussen cultuurgewassen en bodemvocht*. [Relations between crops and soil moisture]. (In: Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek. Commissie voor Hydrologischen Onderzoek, *Verslagen Technische Bijeenkomsten*, 1-6, 1946-1950. Pub. 1952. p. 185-201. 13 figs., table. In Dutch; English, Esperanto and French summaries p. 294-295, 323-324.) DWB—Author discusses relations between relative moisture, suction force, pF values and the water transport of the plant and presents a valuable review (with graphical data) of previous investigations of the relation between the water-consumption and the dry matter production of different crops, giving author and year of publication, but not a single reference. *Subject Headings:* 1. Transpiration 2. Agricultural meteorology 3. Soil moisture.—A.A.

CLIMATOLOGY AND BIOCLIMATOLOGY

CLIMATOLOGY

See also: Upper air circulation in low lat. in relation to certain climatic discontinuities (Frost), 5.1-133; Influence of sea on temp. (Arnaud), 5.1-292.

5.1-258

551.58:63

Ramenskii, L. G., TSatsenkin, P. A. and Rabotnov, T. A., *K voprosu o sel'skokhoziaistvennoi klimatologii*. [On the problem of agricultural climatology.] *Vsesoiuznoe Geograficheskoe Obshchestvo, S.S.S.R., Izvestiia*, 84(5):501-502, Sept./Oct. 1952. DLC—A more extensive investigation of climate in relation to agriculture is proposed. The topics requiring special study are: the effect of radiation, of the atmosphere and of the aqueous and soil environment upon plant growth and development; the relationship of the individual climatic variables and their geographic distribution to agricultural regions; the microclimates of localities; changes in weather and forecasting possibilities; crop yield forecasting and climatic amelioration. In addition, all the indicators used by agricultural climatology should be biologically and ecologically based, and be completely independent of calendar dates. *Subject Headings:* 1. Agricultural climatology.—I.L.D.

5.1-259

551.58:63(71)

Robertson, G. W., *Some agrometeorological problems in Canada*. *Royal Meteorological Society, Canadian Branch [Publications]*, 4(2), 1953. 11 p. 7 figs., 2 tables, 13 refs. DWB—This report is based on a preliminary agrometeorological study started at Ottawa in the summer of 1952. Taking account of the special climatic features of Canada (such as short growing season, etc.) the response of plants to day length, cumulative heat, radiation losses, etc. are analyzed and integrated into a formula of effective crop temperature. Attention is called to the necessity of considering radiant energy, transpiration and wind, if serious errors in evaluating environmental factors are to be avoided. Development of better instruments and methods is indicated as immediate objective of the project. *Subject Headings:* 1. Agricultural climatology 2. Growing season 3. Heat balance 4. Climate of Canada 5. Canada.—G.T.

5.1-260

551.58:63

Seabrook, John M. (*Seabrook Farms, N. J.*), *Applied climatology at Seabrook Farms*. *Weatherwise*, 6(2):36-37, 59, April 1953. DWB—The various phases of climatological activity which benefit the Seabrook Farms and their vast truck garden and processing operations (20,000 acres) are outlined by the owner and manager of these farms. The problems which the Laboratory of Climatology at Seabrook (under Johns Hopkins Univ.) have helped solve are: a) irrigation—when, where and how much water to add to fields; b) phenology—preparing

planting schedules for the half dozen major crops, so the harvest and labor will be smooth and efficient and c) micrometeorological studies to improve crops. Weather forecasts or artificial rain inducement are not "indicated." *Subject Headings:* 1. Agricultural climatology 2. Applied climatology 3. Seabrook Farms, N. J.—*M.R.*

5.1-261

551.58:35

Senter, William O. (*Maj. Gen., U. S. Air Force*), **Climatology applied by the air force.** *Weatherwise*, 6(2):51-52, April 1953. DWB—Examples of major operations in which knowledge of climatology was a guiding factor are: the invasion of Poland by the Germans in 1939 and that of South Korea in 1950. To a lesser extent, climatology assisted in the Berlin Airlift of 1948 (graphical example is given of comparison between estimated and actual hours of contact, instrument, GCA and closed conditions at Tempelhof for Nov. and Dec.). The functions of the several groups in the Directorate of Climatology of the Air Weather Service are outlined, and the fact emphasized that problems are solved by specialists in this Directorate and results expressed in operational terms. Descriptive climatology has been replaced by applied climatology. *Subject Headings:* 1. Military climatology 2. Applied climatology 3. U. S. Air Weather Service. Directorate of Climatology.—*M.R.*

5.1-262

551.58:519.24

Thom, Herbert C. S. (*Climatological Specialist, U. S. W. B., Wash., D. C.*), **Climatology in the Weather Bureau.** Paper presented at CBIAC Meeting at Portland, Oregon, Feb. 20, 1952. 5 p. 4 figs. Mimeo. DWB—A discussion of the value of climatological analysis in predicting weather fluctuations and of the value of climatic data in economic planning and activities. A simple account of the application of statistical analysis to climatological data, with particular reference to precipitation of eastern Oregon, is presented. *Subject Headings:* 1. Climatology 2. Climatic analysis 3. Statistics in climatology 4. U. S. Weather Bureau 5. Eastern Oregon.—*I.L.D.*

5.1-263

551.58(09)(268)

Wright, John K., **The open polar sea.** *Geographical Review*, N. Y., 43(3):338-365, July 1953. 2 figs., refs. DWB—Historical account of earlier hypothesis regarding the climate of the Arctic. Up to the middle of the 19th century it was assumed by many scientists (PETERMANN and others) that the climate around the pole is mild and open navigable water exists. The arguments were based in the beginning on seamen's stories, later on misextrapolation of climatic observations, ocean currents, biological signs, etc. *Subject Headings:* 1. History of climatology 2. Arctic Sea.—*A.A.*

CLIMATE OF PARTICULAR PLACES

See also: **Agricultural met.** (Aujeszky, Berényi, Béll), 5.1-1; **Investigation station in desert** (Kliushkin), 5.1-282.

5.1-264

551.582(54)

Ahmad, Kazi S., **Climatic regions of East Pakistan.** *Pakistan Geographical Review*, Lahore, 7(2):102-112, 1952. 2 illus., 12 refs. DLC—After a general description of climatic characteristics of East Pakistan, as represented by temperature, winds, rainfall, fog, etc., the author discusses the geographic distribution of the five climatic types (ranging from "tropical very wet" to "sub-tropical moderately wet") prevailing over that territory. A map is drawn up with 15 climatic graphs inserted at the locations they represent. *Subject Headings:* 1. Climatic regions 2. Climate of East Pakistan 3. Pakistan.—*G.T.*

5.1-265

551.582(519)

Borsos, József, **Adatok Korea éghajlatához.** [Data on the climate of Korea.] *Időjárás*, 55(7/8):197-198, July/Aug. 1951. table. DLC—Monthly means (for the period 1921-1930) of pressure, temperature and precipitation are tabulated for the Korean seaport cities Joshin (40°40'N; 129°12'E) and Jinsen (37°29'N; 126°38'E) and compared with corresponding

a for Budapest (1901–1930). It is found that winter months are considerably colder in area than in Hungary. The annual precipitation of Korea (most of it occurring in summer) exceeds that of Hungary by 50–100%. A typical feature of Korean climate is abundant snow produced by the proximity of the ocean and strong cooling at night. *Subject Headings:* 1. Climate of Korea 2. Climatic analogs 3. Korea 4. Budapest, Hungary.—G.T.

5.1–266

551.582:63(438)

*Gumiński, Romuald, **Ważniejsze elementy klimatu rolniczego Polski południowo-wschodniej**. [The most important elements of southeast Poland's agroclimate.] *Poland. Państwowy Instytut Hydrologiczno-Meteorologiczny, Wiadomości Służby*, 3(1):57–113, 1951. 29 figs., 34 tables. **DWB**—A climatic outline of southeastern Poland from the agricultural point of view. It is based on a detailed analysis of complete observational data (60 stations) concerning two most important elements: mean, annual and monthly air temperature for the period 1881–1930 and mean amounts of precipitation for 1891–1930. Other elements are analyzed on the basis of observational data for shorter periods and are considered as provisional. The whole work is abundantly provided with tables, charts and maps thoroughly explained in the text. It gives a picture of the landscape of southeastern Poland, the thermal elements of its climate, the soil temperature, precipitation (rainfall and snow cover), some phenological data and, finally, the division of the territory into climatic zones and provinces. *Subject Headings:* 1. Agricultural meteorology 2. Climatic data 3. Poland.—A.M.P.

5.1–267

551.582(569.4)

*Lorch, J. (*Met. Service of Israel*), **Climatological data for the Negev**. *Israel. Meteorological Service, Series A, Meteorological Notes*, No. 4, 1952. 12 p. 7 figs. In English, legends in English and Hebrew. **DLC**—Data, obtained in 1946–1947, discussed. Hourly frequencies of temperature and relative humidity given. *Subject Headings:* 1. Climatic data 2. Temperature frequencies 3. Humidity frequencies 4. Negev, Israel.—A.A.

5.1–268

551.582(649)

Paterson, Sten Sture, **Kanarieöarna—natur och näringar**. [The Canary Islands—nature and food products.] *Ymer*, Stockholm, 72(2):161–182, 1952. 9 figs., 10 refs. English summary p. 182. **DLC**—The subtropical climate of the islands, which is tempered by the Atlantic location of the islands and the cool southward Canary stream between the islands and the continent is discussed. The precipitation is concentrated in two periods—Jan. and Nov., increasing east to west with altitude and decreasing temperature. The “south-weather,” which has a depressing biological influence, occurs in winter with southern air currents bringing humid air from the equator. Air pressure is normally constant, but severe short lived storms bring damage to the banana plantations and soil. Irrigation is a problem in the lower parts of the islands. Annual mean temperature and precipitation values (1942–48) are given in a table. *Subject Headings:* 1. Climate of the Canary Islands 2. Canary Islands.—N.

5.1–269

551.582(467)

*Pedreschi, Luigi, **Minorca, la meno nota delle Baleari**. [Minorca, a sketch of the Balearic islands.] *Società Geografica Italiana, Rome, Bollettino*, Ser. 8, 5(3/4):256–278, May/Aug. 1952. diags., tables, 50 refs. In Italian; English summary p. 278. **DWB**—On p. 259 important recent studies or charts on the climate of the Balearics are reviewed. On p. 261–266 a brief analysis of the winds, rainfall and other climato-geographic factors of Minorca with several isohyetal charts and a table of total annual precipitation of 6 stations for each year 1911–1924 and the mean annual for the period are given. The rest of the article deals with geomorphology, population, economy, vegetation and culture with respect to other islands in the Mediterranean. *Subject Headings:* 1. Climate of Minorca 2. Precipitation distribution 3. Minorca, Balearic Islands.—M.R.

5.1–270

551.582.1(73)

*Borchert, John R. (*Univ. of Minnesota*), **The climate of the central North American grassland**. *Association of American Geographers, Annals*, 40(1):1–39, March 1950. 21

figs., refs. **DLC**—By means of numerous isohyetal and other isopleth charts, the climatic characteristics of the eastern part of the United States and especially the prairies between the east slope of the Rockies and the Mississippi River are vividly depicted and described clearly in the text. The sources of information used in this study are faithfully indicated in footnotes. Ecological aspects, historical and geological changes in climate and vegetation, synoptic conditions giving rise to normal or abnormal temperature, humidity, wind and rainfall (drought, floods, dust storms, etc.) are portrayed. This is one of the more analytical geographic-climatological studies of a given region. *Subject Headings*: 1. Climate of Mid-western United States 2. Climate of Eastern United States 3. Synoptic climatology 4. United States.—*M.R.*

5.1-271

551.582.2(45)

*Polli, Silvio, **Dati climatologici di Trieste e dintorni**. [Climatic data of Trieste and neighborhood.] *Trieste. Istituto Talassografico, Pubblicazioni*, No. 284, 1953. 10+p. tables. **DWB, DLC**—Monthly climatic data are tabulated for Trieste (100-year records) and the nearby towns of Barcola (21 years), Servola (16), Opicina (27), Basovizza (34) and S. Croce (10). Geographical conditions of the localities are described. There appears to be a considerable difference between coastal stations and those situated on the subalpine promontories. *Subject Headings*: 1. Climatic data 2. Climate of Trieste 3. Long period records 4. Trieste.—*G.T.*

5.1-272

551.582.2(718)

*Hare, F. Kenneth (*Assoc. Prof. Geography, McGill Univ.*), **The climate of the island of Newfoundland: a geographical analysis**. Canada. *Dept. of Mines and Technical Surveys. Geographical Branch, Geographical Bulletin*, No. 2:36-88, 1952. 21 figs., 10 tables+tables in append., refs. In English; French summary p. 88. **DLC**—A comprehensive study, giving charts of mean, maximum and minimum temperature for Jan. and July, first and latest day of frost, duration of frost free season, annual precipitation and snowfall, beginning and duration of growing season, annual potential evapotranspiration, moisture index and moisture surplus according to THORNTHWAITE and frequency of fog in surrounding seas. Climatological data (temperature, rainfall, cloudiness) presented for 27 stations. Additional selected data given for humidity (at Gander), rainfall variability, frequency of fog, blowing and drifting snow, cloud heights, visibility, "thick weather" and gales. Formation of climatic conditions explained by distribution of ocean currents and ice. Some discussion devoted to access by air and by sea. *Subject Headings*: 1. Climate of Newfoundland 2. Climatic data 3. Newfoundland.—*A.A.*

CLIMATIC CHANGES

5.1-273

551.583

Brooks, Charles E. P., **Outlook unsettled; climate does not stand still**. *Sunday Times*, London, April 5, 1953. diagr. Abstracted from a clipping. **DLC**—Deals with trends in warmth and raininess over the British Isles since 1 A.D. The curve prior to 1680 is constructed from notes in old chronicles, consideration of Norse voyages, etc. *Subject Headings*: 1. Climatic changes 2. Great Britain.—*A.A.*

5.1-274

551.583(73)

Rodewald, Martin (*Hamburg*), **Rückgang der Klimaänderungen in den Vereinigten Staaten**. [Retreat of climatic changes in the United States.] *Geografiska Annaler*, 39(1/2): 159-167, 1952. 7 figs., table, 3 refs. **DWB**—In order to determine the cause of climatic change in the United States the author investigated the variations from the normal of the air temperature and precipitation for the decades 1931-40 and 1941-50. As compared with 1931-40 there was a decrease in temperature and an increase in precipitation deviation from the normal. The excess of temperature above the normal declined from +0.44°C to +0.14°C and the precipitation increased from -3.3% below to +3.7% above the normal. Isolines

strating regional distribution show that as compared with 1931-1940 the greatest heat excess and greatest moisture deficiency has shifted. The largest temperature excess is shown in the Atlantic States which also show the greatest moisture deficit. Also the Middle West has experienced the greatest change which during the period 1941-50 has become cooler by 0.7°C and wetter by as much as 20%. *Subject Headings: 1. Climatic changes United States.—I.L.D.*

5.1-275

551.583.2

Le Danois, Édouard, *Le rythme des climats dans l'histoire de la terre et de l'humanité*. [The rhythm of climate in the history of the earth and of man.] Paris, Payot, 1950. 204 p. 10 figs. *Bibliothèque Historique*. **DLC**—The theory is propounded that the oceans are the principal source of the heat energy which produces the atmospheric circulation and climatic variation. The waters of the oceans consist of two layers differing in origin (polar and tropical) and in salinity. The tropical waters encroach upon the polar waters and the amplitude of the movements has a periodicity determined by lunar and also by solar periods. This periodicity of internal oceanic tides, moon, sun and earth is used to account for climatic changes during geologic time; climatic rhythms of various durations are established. The author describes geologic climates, the biological and climatic consequences of the oceanic encroachments, and presents a naive account of climatic determinism in the rise and fall of civilization in the history of France. Also the origin of deserts and present climatic trends are discussed. *Subject Headings: 1. Climatic changes 2. Oceanic influences.—I.L.D.*

5.1-276

551.583.3(4):551.577.2

Klein, Annemarie, *Die Niederschläge in Europa im Maximum der letzten Eiszeit. Versuch einer Rekonstruktion aus dem Höhenunterschied zwischen damaliger und heutiger Schneegrenzlage*. [The precipitation in Europe at the maximum of the last ice age. Attempt at a reconstruction from the height difference between the snow line then and now.] *Verhandlungen der Deutschen Geographischen Gesellschaft, 97(2):98-104, 1953*. chart, 4 tables, 21 refs. **DWB**—Assuming that a fall of July temperature by 0.7-0.9°C or an increase of annual precipitation by 150 mm would depress snow line by 100 m, the annual precipitation at Wurm maximum is calculated from the temperatures estimated from frost and forest limits. The values found range from 21% of present precipitation in Hohe Tatra to 80% over northern inland ice sheet. *Subject Headings: 1. Precipitation charts 2. Quaternary climates 3. Europe.—C.E.P.B.*

5.1-277

551.583.7:551.311

†Cailleux, André, *Morphoskopische Analyse der Geschiebe und Sandkörner und ihre Bedeutung für die Paläoklimatologie*. [Morphoscopic analysis of erratics and sand grains and their significance for paleoclimatology.] *Geologische Rundschau*, Stuttgart, 40(1):11-19, 1952. 4 tables, 6 figs., 38 refs. **DLC**—Rounded limestone erratics come either from fluvio-glacial rivers or rivers in a warm rainy climate; those flattened, little rounded and asymmetric from periglacial rivers. Rounded matt quartz grains are wind-worn. Good examples are found in recent Sahara sands, in periglacial Quaternary of central Europe and in many early glacial formations. The reason for their early abundance may be that land plants had not yet appeared. *Subject Headings: 1. Sub-aerial deposits 2. Paleoclimates.—C.E.P.B.*

5.1-278

551.583.7:552.578

Schwarzbach, Martin (Cologne), *Zur Frage des Zusammenhangs zwischen Erdölmuttergestein und Vorzeitklima*. [The question of the connection between petroleum bearing rock and early climate.] *Geologische Rundschau*, Stuttgart, 40(1):81-83, 1952. refs. Discussion preceding article by H. Borchert, p. 83. **DLC**—H. BORCHERT considered that oil-bearing rocks were formed in deep water when there was no polar ice. Author thinks other, non-maternal factors were involved, because: 1) the Red Sea sediment, for example, is poor in organic material; 2) oil-bearing rocks are mostly shallow water deposits and 3) the poles were mostly ice free but oil-bearing rocks are rare. *Subject Headings: 1. Paleoclimates 2. Petroleum bearing rocks. I. Borchert, H.—C.E.P.B.*

MICROCLIMATOLOGY

See also: Climatic environment (Brooks), 5.1-3; Effects of aspect on valley temp. (Davies), 5.1-178.

5.1-279

551.584

Biel, Erwin R. (*Prof. Met., Rutgers Univ.*), Climate may be hotter, colder near the ground. *Science Digest*, Chicago, 33(2):84, Feb. 1953. DWB—Plants on the surface of the ground must undergo a much wider range of temperature and humidity than would be suspected from readings made in a conventional instrument shelter at 6 ft height. However, more can be done to alter the microclimate than can be done to change the general climate. Examples such as dusting snow with black powder, growing shelter belts, irrigation, etc. are cited. *Subject Headings*: 1. Microclimatology 2. Microclimatic amelioration.—M.R.

5.1-280

551.584.61

*Ōta, Iwao, Some observations of microclimate in glass-room. *Tokyo. Forest Experiment Station, Bulletin*, No. 59:85-98, March 1953. graphs, diagr., photo. In Japanese; English summary p. 98. DWB—Comparative data are presented for the microclimate in a glass room and in the field. The data were obtained for 12 months starting Feb. 1951. The microclimates in the glass room differed from those in the field according to opening conditions of windows and doors and according to weather conditions. Each location within the room showed different microclimatic conditions. Control of opening conditions and proper adjustment of the arrangement of plants is recommended. *Subject Headings*: 1. Greenhouse climates 2. Indoor temperatures.—*Author's abstract*.

5.1-281

551.584

Roberts, M. H., Some aspects of microclimatology. *Farming in South Africa*, Pretoria, 27(318):437-440, Sept. 1952. 4 figs., 4 refs. DA—The ordinary climatic records are based upon observations made at a height of 4 ft; weather stations are generally planned in representative localities; climatic classifications are based upon means. Hence the usual climatic data are not suitable for studying the climate at plant level or the microclimate. The variations of the various meteorological elements within the microclimatic layer, the topographical influences upon microclimate—leeward and windward sides of hills, solar orientation—the role of turbulence, and the effect of soil and soil cover are discussed qualitatively. *Subject Heading*: 1. Microclimatology.—I.L.D.

CLIMATIC CLASSIFICATION

5.1-282

551.585.53 551.582(58)

Kliushkin, E. A., Nauchno-issledovatel'skaia stantsiia v pustyne. [Scientific research station in a desert.] *Priroda*, Moscow, No. 1:70-73, Jan. 1953. illus. DLC—A sand and desert research station at Repetek near Chardzhou in Turkmenian S.S.R. was established in 1912. Research in climate, moisture and of sand movement, ecology, agriculture, etc. (250 scientific papers published) carried out. Annual precipitation 100 mm (mostly from Dec. to April); maximum temperature 40°C (49° in lower layers, 80° at the sand surface), minimum temperature -27°C; relative humidity often <10%; wind SW in winter, NW in summer. *Subject Headings*: 1. Desert research 2. Desert climates 3. Repetek, Turkmenistan, U.S.S.R.—A.A.

5.1-283

551.585:63

Fair, T. J. D., Agricultural regions and the European rural farm population of Natal. *South African Geographical Journal*, Johannesburg, 34:3-19, Dec. 1952. 6 figs., 10 refs. DWB—The different agricultural regions are described in detail. On p. 7 is found a brief description of how altitude (temperature) and rainfall (or drought) affect agriculture in Natal. Farming is successful when terrain is not too rugged at elevations up to 5500 ft, and when annual rainfall is >30". Where rainfall is <30" the land is considered marginal since it occurs in deep valleys where summer temperatures are too high for most types of farming.

chart of mean annual rainfall for Natal (according to 5 class intervals) is presented on p. 8.
Subject Headings: 1. Agroclimatic regions 2. Rainfall distribution 3. Altitudinal influences
 on Natal, South Africa.—*M.R.*

BIOCLIMATOLOGY

See also: Climatic environment (Brooks), 5.1-3; Sum, mean and mean extreme temp. in phenological intervals (Schneider), 5.1-54; Pocket hygrothermograph investigations (Manig), 5.1-69; Nuclei content of air in health resorts (Zenker), 5.1-219.

5.1-284 551.586:63
 Whyte, Robert Orr, **Crop production and environment**. London, Faber and Faber, 1946. 372 p. 32 plates, bibliog. p. 337-355. **DLC**—Book deals, inter alia, with effects of light and other radiation, and temperature on plants including vernalization, hardening and effects of altering periods of exposure to light and humidity. Geographic distribution of crops in relation to climate also dealt with. Main purpose of book is to explain to practical cultivators the work of plant biologists. **Subject Headings:** 1. Crop yield 2. Environmental influences on crops.—*C.E.P.B.*

5.1-285 551.586:631:632.1
 †Dale, Robert Frederick, **The influence of phenological period rainfall on the yield of corn in Iowa**. Thesis (*M.Sc.*)—Iowa State College of Agriculture and Mechanic Arts, 1948. p. 15 figs., 9 tables, 31 refs. Mimeo. **DWB**—After an extensive review of the literature on weather and corn yield, the author cites statistical tests made by J. WARREN SMITH on the relation between rainfall and yield of corn, indicating that the rainfall for the first two weeks after tasseling is the most critical. Other studies in Iowa, Illinois and Indiana show varying correlations—some indicate the rainfall before tasseling is the most important. Studies made on the basis of extensive corn phenology and weather data for several individual Iowa counties indicate that there are two critical periods: one 3 to 5 weeks before corn is 50% silked, and one 2 weeks after; the second period being less critical than the first. Temperature and excessive rainfall are complicating factors, as well as the time trend which is due to use of hybrid corn and better farming methods. **Subject Headings:** 1. Corn phenology 2. Crop yield 3. Rainfall damage to crops 4. Iowa.—*M.R.*

5.1-286 551.586:632.7:634.9
 Schimitschek, Erwin (*Mariabrunn Forstliche Bundes-Versuchsanstalt*), **Ursachen von Massenvermehrungen der Tannentrieblaus *Dreyfusia Nüsslini* C.B.** [Causes of the mass increase of the spruce louse *Dreyfusia Nüsslini* C.B.] *Wetter und Leben, Sonderheft*, No. 148-54, May 1952. fig., 6 refs. **MH-BH**—The effect of climatic conditions upon the life cycle of this particular insect is discussed. Warm, dry, spring weather is followed by increases in the population of spruce louse and such favorable weather has persisted since 1945. The importance of microclimatic factors in the development of the spruce louse in the areas that are marginal for the growth of spruce is examined. The increase in spruce lice in lower Austria between Mondsee and Altersee indicates also that areas with high precipitation but with favorable temperatures can be propitious for the life cycle of the spruce louse. The utilization of microclimatic principles for combating this pest is considered. **Subject Headings:** 1. Forest entomology 2. Insect control.—*I.L.D.*

5.1-287 551.586:632.9 634
 †Hawboldt, L. S., **Climate and birch dieback**. Nova Scotia. *Dept. of Lands and Forests, Bulletin*, No. 6, March 1952. 37 p. 11 figs., 3 tables, 68 refs. **MH-BH**—The history of various birch diseases is summed up and their symptoms and development are described. Literature containing comments on climate and dieback and on recent climatic fluctuations is quoted. Conclusive evidence as to a direct effect of weather conditions on birch diseases is found to be lacking but the healthiest stands in general appear to be situated on sites where

moisture and temperature conditions are favorable. Data on the extent of birch dieback and on temperature and precipitation in Nova Scotia and New Brunswick (1870-1949) are tabulated. *Subject Headings:* 1. Climatic influences 2. Plant diseases 3. Forestry 4. Nova Scotia 5. New Brunswick.—G.T.

5.1-288

551.586:632.9

Schrödter, Harald, *Über die Bedeutung klimatischer Faktoren für das Rutensterben der Himbeeren*. [On the importance of climatic factors in the death of raspberry vines.] *Angewandte Meteorologie*, 1(6):184-189, June 1952. 3 figs., table, 6 refs. MH-BH—An investigation of the climatic conditions which favor the infection of raspberry vines by the fungi *Didymella applanata* and *Leptosphaeria coniothyrium* and the consequent death of the vines. Mean daily temperatures (0700, 1300 and 1900) at a height 50 cm within the stands and time of incubation of the disease after infection were recorded. Empirical equations relating incubation time to mean temperature by means of a hyperbolic function show that the period of incubation depends upon temperature in such a way that the disease becomes visible only when the infection attains and exceeds a given temperature summation, which depends upon the raspberry variety; the temperature summation begins with thermal developmental zero point of 5°C. The influence of soil moisture is manifested in the fact that localities with slight variations in soil moisture are most unfavorable for the disease producers. *Subject Headings:* 1. Agricultural climatology 2. Plant diseases 3. Temperature effects.—I.L.D.

5.1-289

551.586:633.1

Daigo, Y. and Suzuki, Y., *Climatic division concerning (sic) with the yield of aquatic rice, wheat, common barley and naked barley*. *Journal of Meteorological Research*, Tokyo, 3(3):79-98, Feb. 1951. 11 figs., 8 tables, 2 refs. In Japanese; English summary p. (5). DWB—An examination of the climatic factors influencing the yield of these crops showed that the yield of aquatic rice is closely related to the vegetation period, the number of days of minimum temperature above 5°C during the year, and the amount of precipitation from May to Oct.; and that the yields of wheat and barley are closely related to the number of days with minimum temperature below 5°C during a year and the amount of precipitation from April to June. Regression equations between yield per ton for each of these crops and the climatic conditions are given. *Subject Headings:* 1. Grain crops 2. Ecology 3. Temperature effects 4. Precipitation effects 5. Agricultural climatology.—I.L.D.

5.1-290

551.586:633.35:581.5

von Poletika, W., *Vergleichende Klimaökologie der Sojaanbauggebiete Eurasiens und Nordamerikas unter besonderer Berücksichtigung der deutschen Verhältnisse*. [Comparative climatic ecology of the soya regions of Eurasia and N. America with special reference to Germany.] *Germany. Deutscher Wetterdienst in the US-Zone, Berichte*, No. 42:406-414, 1952. 9 figs., table, 13 refs. DWB—The ecological limits of soya culture are set out, and a "hydrothermic" coefficient $K = \Sigma N / (\Sigma t_{10} : 10)$ defined, N = rainfall, t_{10} = temperature above 10°C. Soya area in U.S.A. is compared with maize area. Supplement gives climatic conditions and values of K for 97 stations in soya areas of Eurasia and U.S.A. *Subject Headings:* 1. Soya bean cultivation 2. Germany 3. United States 4. Eurasia.—C.E.P.B.

5.1-291

551.586:634:632.7(79)

Jeppson, L. R., *Climate and citrus mites*. *California Citrograph*, Los Angeles, 37(7):277-299, May 1952. DWB—Since 1941 the prevalence of the citrus red mite (and several other citrus mites) has been increasing in the Riverside and Redland, Calif. areas and to some extent in the San Joaquin Valley. It has not been found in the warmer and drier parts of the state, however. Effectiveness of control measures depends on weather (most effective from 75°-90°F, and adversely influenced by moisture). Mite populations are influenced by small variations in weather conditions, so different varieties of mites thrive in different climatic

es of California and in different years. Research along these lines is being made by the divisions of Biological Control and Entomology of the University of California. *Subject Headings:* 1. Agricultural climatology 2. Citrus mites 3. Citrus fruits 4. Southern California.—*M.R.*

ENVIRONMENTAL INFLUENCES AND SYNOPTIC CLIMATOLOGY

See also: Regional differences in world atmos. circulation (Borchert), 5.1-131; Discontinuity lines of topographic origin (Sugawara), 5.1-154; Orographic influences on atmos. pressure and currents (Suguki), 5.1-187.

5.1-292 551.588.1:551.524.3(449.3) 551.589
 §Arnaud, C., *Influence de la mer sur les températures. Quelques types de vent d'Est. Influence of the sea on temperature. Some types of eastern winds.* [La Météorologie, Ser., No. 26:55-67, April/June 1952. 17 figs., ref. English and Spanish summaries p. 55.]
 †I-BH—A statistical and synoptic study of the seasonal, diurnal and local variations in temperature and in wind (especially the East wind or sea breeze) at Toulon-la-Mitre and at Luc (which is only 49 km from Toulon). The Toulon station, located on a point in the Mediterranean, naturally is cooler in the daytime and warmer at night in the warm months, and warmer in the daytime during winter, than Luc, which has a continental climate. The magnitude of the differences in temperature and wind are striking and the time of maximum temperature (sometimes before the sea breeze reaches a maximum and sometimes after) is unusual compared with continental stations. The 3 synoptic types that produce east winds of short or long duration or rainfall, are illustrated by series of analyzed surface charts. *Subject Headings:* 1. Marine influences 2. Temperature variations 3. Synoptic climatology 4. Toulon-la-Mitre, France 5. Luc, France.—*M.R.*

5.1-293 551.588.1
 Hela, Ilmo, *Regional distribution of the continentality in the climate of the oceans.* [Fennoscandica, Helsinki, 4(2):41-47, 1953. 3 figs., table, 6 refs. DWB—A modified continentality index, based on latitude and annual temperature range, is proposed with constants derived from climatic data for Siberia and NE Atlantic, which also gives reasonable values for tropical regions. Continentality maps, presented for the oceans between 0° and 60°N, show the great climatic effect of the Asiatic and North American continents on the seasonal temperature variation over the sea. *Subject Headings:* 1. Continentality 2. Annual temperature range 3. Ocean climates.—*A.A.*

5.1-294 551.588.1
 †Lauer, Wilhem, *Humide und aride Jahreszeiten in Afrika und Südamerika und ihre Beziehung zu den Vegetationsgürteln.* [Wet and dry seasons in Africa and South America, and their relation to vegetation zones.] *Bonner Geographische Abhandlungen*, Bonn, No. 15:85-98, 1952. maps, 12 diagrs., 29 tables in text, map and 4 tables at end of book, bibliog. 186-96. DWB—Using the aridity index of DE MARTONNE, the author has determined the aridity or humidity of each month for Africa and South America and has classified the climates of these continents on the basis of the number of humid months per year. This classification together with "isohygrograms" are represented on a map. A comparison of the isohygrograms of the two continents with the climatic vegetation types shows that the large scale natural vegetation zonation of Africa and South America is a reflection of the number of humid or arid months. *Subject Headings:* 1. Arid zone climatology 2. de Martonne index 3. Climatic classifications 4. Africa 5. South America.—*I.L.D.*

5.1-295 551.588.2(45):551.513.2
 Cicala, Aldo, *Contributo alla climatologia dinamica della Sicilia.* [Contribution to the dynamic climatology of Sicily.] *Rivista di Meteorologia Aeronautica*, 12(1):22-30, Jan./March, 1952. 9 figs. Italian, French, English and German summaries p. 22. MH-BH—A study of the orographic effects on different types of air flow over Sicily. Air flow from each direction is discussed with respect to seasonal frequency, cyclonic activity, resulting precipita-

tion, cloudiness, surface wind speed, etc., especially in the N and E portions. *Subject Headings:* 1. Dynamic climatology 2. Climate of Sicily 3. Sicily.—*M.R.*

MISCELLANEOUS APPLICATIONS

SOLAR INFLUENCES

5.1-296

551.590.2:551.521

†Hanle, Wilhelm (*Justus-Liebig-Hochschule, Giessen*), *Die Erde im Strahlungsfeld von Sonne und Kosmos*. [The earth in the radiation field of the sun and universe.] Giessen, W. Schmitz, Dec. 1948. 39 p. 2 tables, 23 figs., bibliog. p. 37-38. *Giessener Naturwissenschaftliche Vorträge*, No. 1. **DLC**—A review of current knowledge of solar and cosmic radiation effects on the earth's atmosphere, etc.; corpuscular and wave radiation; the nature of the sun; visible radiation, UV, infrared, short wave, X and gamma radiation; meteors and meteorites; particle radiation and, finally, effects at high altitudes and the short and long period variations are discussed in separate chapters. Useful tables of the relative masses of meteorites, electrons, positrons, protons, neutrons, etc., and the electromagnetic spectrum with corresponding wave length, frequency and energy in electron volts are appended. *Subject Headings:* 1. Solar radiation effects 2. Cosmic radiation 3. Electromagnetic spectrum.—*M.R.*

5.1-297

551.590.21:551.577(73)

*Mauchly, John W. (*Eckert-Mauchly Div., Remington Rand, Inc.*), *Evidence for effects of day-to-day solar variations on weather*. Rev. digest of paper to be presented April 30, 1953 before the American Meteorological Society meeting in Washington, D. C. (Climatology session) 6 p. tables. Mimeo. **DWB**—Mean ratio of average precipitation over North America on solar disturbed days to the mean on all days, computed for 48 months, is 9.2% below unity which is 3.05 times the standard deviation expected by chance. Combining the deviation with similar ratios computed for wind speed at single stations, and applying HORTLING's "T" test, a still higher significance level was found. *Subject Headings:* 1. Solar influences 2. Precipitation 3. U.S.A.—*A.A.*

VISIBILITY

See also: **Visual thresholds** (Bouman), 5.1-31; **Visual range calculation** (Pinegin, Boldyrev, Barteneva), 5.1-32; **Annual met. tables** (Falkland Islands, Met. Service), 5.1-46.

5.1-298

551.591(52)

*Kurihara, S. (*Niigata Univ.*), *Statistical research on visibility*. *Meteorological Society of Japan, Journal*, 31(2):60-75, Feb. 1953. 7 figs., 7 tables, 8 refs., 5 eqs. In Japanese; English summary p. 60-63. **MH-BH**—This study is based on meteorological observations at Takada, Nagano, Kumagaya and Yokohama (1949-1951). The data presented in tabular and graphical form show the relation between visibility and relative humidity, wind direction, wind velocity and snowfall. Seasonal and diurnal variations of visibility are also analyzed. Empirical formulas are derived for the dependence of visibility on these factors. *Subject Headings:* 1. Visibility 2. Visibility variations 3. Visibility data 4. Japan.—*G.T.*

5.1-299

551.591:551.510.42(52)

Miura, Akira (*Tohoku Univ.*), *Opacity and atmospheric impurities*. *Tohoku University, Science Reports, 5th Ser., Geophysics*, 4(3):116-124, March 1953. 26 figs., 16 refs. **MH-BH**—On the basis of simultaneous observations of visibility, relative humidity, wind speed, the number of condensation nuclei and the quantity of atmospheric impurities, the author undertakes a graphical investigation of correlations between these factors. The observations were made at Tohoku University (Aug. 1951-July 1952). Instruments and methods used are described. It is found that opacity at Sendai increases with increasing humidity and atmospheric impurities; it decreases with wind speed over the land; it appears to be practically independent of the number of condensation nuclei. *Subject Headings:* 1. Visibility 2. Atmospheric pollution 3. Sendai, Japan.—*G.T.*

OPTICAL PHENOMENA

See also: Colored sun (Penndorf), 5.1-6; Explanation of brightness and color of sky (Hulburt), 5.1-158.

5.1-300

551.593

Piaskovskaia-Fesenkova, E. V., *Nekotorye svoïstva atmosferynykh indikatrix rasseianiia sveta*. [Some characteristics of the atmospheric indices of light scattering.] *Akademiia Nauk, S.S.S.R., Doklady*, 88(1):53-56, 1953. 3 tables, ref., 9 eqs. DLC—Author came to the conclusion that for a certain angle of scattering $55^\circ \leq \vartheta \leq 60^\circ$ the ratio μ/π is practically constant ($1/4\pi$) and does not depend on the form of the atmospheric indices of scattering or the wave length (μ —coefficient of scattering under the angle ϑ , τ —optical thickness of the atmosphere in the given part of the spectrum without absorption). This conclusion, verified by observations, is checked against the theoretical results of KRAT which give the same result. *Subject Headings: 1. Scattering of light 2. Atmospheric optics.—A.A.*

5.1-301

551.593.1

Squire, Charles F. (*The Rice Inst., Houston*), *Note on reflection and diffraction from ice crystals in the sky*. *Optical Society of America, Journal*, 42(10):782, Oct. 1952. photo. Jackinot, P. and Squire, C. F., (same title) *ibid.*, 43(4):318, April 1953. ref. DWB—In note 1 the author presents a photograph (one among several taken in flight on Feb. 6, 1952 at 12,000 ft over the Tennessee mountains around noon) showing a circular spot of sunlight reflected by ice crystals and an elliptical diffraction ring surrounding it. Details of photographic exposure are described. Note 2 gives a simple explanation of the elliptical diffraction ring; the only requirement is an arrangement of the flat surfaces of the ice crystals in a horizontal plane with which the sun's rays form a certain angle. *Subject Headings: 1. Refraction phenomena. I. Jackinot, P.—G.T.*

5.1-302

551.593.55

Berthier, Pierre, *Variations d'intensité des raies 6300 et 6364 Å de l'oxygène au cours des crépuscules du matin et du soir*. [Variations of the intensity of the 6300 and 6364 Å radiation of oxygen during twilight.] *Académie des Sciences, Paris, Comptes Rendus*, 236(16):593-595, April 20, 1953. 2 figs., refs. DWB—This paper is a contribution to the study of the twilight oxygen spectrum by measurements made with a spectrograph having particularly strong dispersivity (340 Å/mm at 6300 Å). The instrument was constructed by COJAN. Results of the measurements are graphically analyzed. The curve of luminescence as a function of altitude shows maximum intensity between 90 and 100 km. *Subject Headings: 1. Spectrophotometry 2. Twilight luminescence spectra 3. Oxygen spectra.—G.T.*

5.1-303

551.593.652:551.558.21

Barrington, C. R.; Wilkins, J. W., *Iridescent wavelike clouds*. *Meteorological Magazine*, London, 82(974):248-249, Aug. 1953. fig., plate. MH-BH—BARRINGTON describes up to 6 ACu bands at London Airport, Feb. 19, 1953, forming crests of successive waves. WILKINS describes similar clouds seen from Dunkeld, Scotland, May 25, 1953. *Subject Headings: 1. Nacreous clouds 2. Lee waves.—C.E.P.B.*

ELECTRICAL PHENOMENA

See also: Elect. properties of blizzards (Barré), 5.1-2; Radioactive snow gage (Gerdel), 5.1-65; Morphology of ionospheric variations associated with magnetic disturbance (Martyn), 5.1-116.

5.1-304

551.594

Israël, Hans, *Rapporti fra i fenomeni elettrici e meteorologici nell'atmosfera*. [Relationship between electric and meteorological phenomena of the atmosphere.] *Geofisica e Meteorologia*, Genoa, 1(2):94-14, Jan./Feb. 1953. 15 figs. DWB—A comprehensive summary of current knowledge concerning diurnal and seasonal variations in the electric field of the earth and atmosphere, under different latitudinal, geographical and meteorological conditions. The

relation to the diurnal variation in water vapor in the atmosphere is vividly illustrated as are also other variations (examples of graphs from stations in all parts of the world are reproduced). *Subject Headings:* 1. Electrical phenomena 2. Diurnal atmospheric electricity variations.—*M.R.*

5.1-305

551.594.1:551.551 (483)

Norinder, Harald and Siksna, Reinharde, **Variations of the concentration of ions at different heights near the ground during quiet nights at Uppsala.** *Arkiv för Geofysik*, Stockholm, 1(19):519-541, 1953. 20 figs., refs. p. 540-541. DWB—Ion density in the air near the ground was measured by section of air from different levels. Its dependence on turbulence is discussed. Apparatus and techniques used are described. Some disturbances arose from insect and radioactive deposits. Results presented graphically for selected nights, distinguishing small and large ions and showing also temperature, humidity and wind conditions. *Subject Headings:* 1. Ion density 2. Turbulence in the frictional layer 3. Uppsala, Sweden.—*A.A.*

5.1-306

551.594.1

*Argentina. Servicio Meteorológico Nacional, **Resumen y analisis de observaciones de electricidad atmosférica (Pilar), 1924-1936.** [Resumé and analysis of observations of atmospheric electricity at Pilar Geophysical Observatory, 1924-1936.] *Argentina. Servicio Meteorológico Nacional, Series B*, Sec. 2, Pt. 3, No. 1, 1952. mostly tables and graphs. DWB.—This report presents an elaborate statistical and graphical analysis of the data on atmospheric potential gradient, ionization and coefficient of dispersion for each month from 1924-36. Analyses include average diurnal and seasonal values of these elements and correlation with precipitation, wind speed, etc. The station is described. *Subject Headings:* 1. Magnetic observatories 2. Atmospheric potential gradient data 3. Ionization data 4. Pilar Geophysical Observatory, Cordoba, Argentina.—*M.R.*

5.1-307

551.594.11

Venkiteshwaran, S. P., Dhar, N. C. and Huddar, B. B., **On the measurement of the electrical potential gradient in the upper air over Poona by radiosondes.** *Indian Academy of Sciences, Bangalore, Proceedings, Sec. A*, 37(2):260-267, Feb. 1953. 3 figs., 4 refs. DLC—A method of measuring continuous variations in potential gradient with height is described and illustrated. The device is attached to an ordinary U. S. Signal Corps radiosonde and the record received is similar to the usual temperature record—that is, a continuous series of dots show the ambient electrical conditions except when the transmitter arm is recording pressure at fixed intervals. Either positive or negative or both types of potential gradient can be recorded if the connections are properly arranged before the ascent. Lead nitrate fuses or polonium collectors give similar soundings as shown by 2 flights made about a half hour apart at Poona. *Subject Headings:* 1. Atmospheric potential gradient measurement 2. Radiosondes 3. Poona, India.—*M.R.*

5.1-308

551.594.12

Vitale, Bruno, **L'equilibrio ionico nella bassa atmosfera e le teorie sulla ricombinazione.** [The ion equilibrium of the lower atmosphere and the theories of recombination.] *Annali di Geofisica*, 5(2):257-271, April 1952. 3 figs., 2 tables, 15 ref. Italian and English summaries p. 270-271. MH-BH—Simplifying hypotheses used in the study of ion equilibrium are examined as well as their applicability to the study of the low atmosphere. A similar analysis is conducted on the ion recombination theories and on the theoretical expressions of the recombination coefficients. With the use of particular simplifying hypotheses, relationships between limit ionic densities, recombination coefficients and some meteorological agents responsible for the equilibrium, namely temperature and condensation nuclei size, are obtained. *Subject Headings:* 1. Ion equilibrium 2. Ion recombination theory.—*Author's abstract.*

5.1-309

551.594.14

Hess, Victor F. (Fordham Univ., N. Y.), **On the ionization produced by gamma radiation from the ground and from the atmosphere.** *Journal of Geophysical Research*, 58(1):67-72,

arch 1953. table, 5 refs., 4 eqs. **DWB**—Two new methods for quick determination of the ionization produced by the gamma rays from the radioactive substances in the ground are discussed. The first ("absorption method") utilizes partial screening of a portable ionization meter with a lead shield of one centimeter from the bottom and from the sides, and empirical determination of its absorbing power. This method was tried out in field experiments and its results agree very well with the results obtained with the conventional method (alternative measurements over soil and over water). The second method ("well method") consists in placing a cylindrical ionization chamber inside an iron housing with a wall 10 cm thick, but open at the top and on the bottom. The chamber is used in two positions inside this "iron well" and from the difference of ionization observed at these two positions the total value of the terrestrial gamma radiation can be derived. Both methods can also be used for determining the gamma radiation coming from the atmosphere ("air radiation"); however, the smallness of this effect makes it difficult to get reliable results. Discrepancies arising in this case are discussed. *Subject Heading: 1. Radioactive emanations.—Author's abstract.*

5.1-310

551.594.21

Norinder, Harald and Siksna, Reinhard, **Ionic density of the atmospheric air near the ground during thunder-storm conditions.** *Arkiv för Geofysik*, Stockholm, 1(16):453-472, 1953. 14 figs., refs. p. 471-472. **DWB**—Investigating ionic density near the ground during thunderstorms, a rise of the concentration of small ions of both polarities during showers of precipitation was observed. The increase occurs in few minutes, and the density then decreases rapidly (sample figures shown). "Corona discharge of the high charged precipitation particle and the radioactive substances in precipitation may be assumed as the producers of ions." No influence of lightning strokes on ionic density was observed. Some observations made on "showers" of large ions. *Subject Headings: 1. Thunderstorm electricity 2. Ion density.—A.A.*

5.1-311

551.594.51

Sayers, N. D. and Emeleus, K. G. (*Queen's Univ., Belfast*), **Experiments on production of auroral radiation.** *Physical Society of London, Proceedings, Ser. A*, v. 65, Pt. 3(387):219-226, March 1, 1952. 3 figs., 14 refs. **DWB**—Further experiments have been made on the production in the laboratory of the "forbidden" red and green auroral lines, and the ultraviolet transauroral line of OI. The mean concentration of oxygen atoms in the $1'S_0$ and 5^5D states in the columns has been found from absolute intensity measurements. The decay of the green radiation produced by a Tesla discharge through a high pressure source has been investigated with a photomultiplier tube. It occurs at approximately the rate to be expected if the atoms in the 'S state are undergoing spontaneous transitions to lower atomic levels, but complicating factors make it difficult to deduce transition probabilities from the experiment. *Subject Headings: 1. Auroral radiations 2. Artificial auroras.—Authors' abstract.*

5.1-312

551.594.7:551.510.535

Kilpatrick, E. L. (*Natl. Bureau of Standards, Wash., D. C.*), **Polarization measurements of low frequency echoes.** *Journal of Geophysical Research*, 57(2):221-226, June 1952. 3 figs., 14 refs. **MH-BH**—Polarization of a 160 kc plane polarized signal propagated upwards and reflected by the ionosphere at Sterling, Virginia, October 15-November 30, was characterized by a stable elliptical pattern oriented 60-70°E of magnetic north, ratio of axes $\frac{1}{2}$ to $\frac{1}{3}$ and left and rotation of polar vector. Short periods of unstable polarization occurred at sunrise, sunset and irregular times. *Subject Heading: 1. Ionospheric reflection.—C.E.P.B.*

ACOUSTICAL PHENOMENA

5.1-313

551.596.1:551.547

Caro, D. E. and Martin, L. H., **Velocity of sound in air at low pressures.** *Nature*, London, 172(4374):363-364, Aug. 22, 1953. 5 refs., 2 eqs. **DLC**—A significant increase of velocity of sound has been reported below 15 cmHg. New experiments are described. After correction was found that at 1000 and 250 cycles/sec there is no variation of free-space velocity with pressure down to 5 mmHg. *Subject Heading: 1. Acoustical propagation.—C.E.P.B.*

5.1-314

551.596.1:534.2

†Post, E. J. (*Natl. Res. Council, Ottawa, Canada*), **Radiation pressure and dispersion.** *Acoustical Society of America, Journal*, 25(1):55-60, Jan. 1953. 3 figs., bibliog. p. 59-60, 8 eqs. **DLC**—The present paper starts with a brief discussion of the two components of acoustical radiation pressure in contrast with the single component obtained for electromagnetic radiation in vacuum. The two components of acoustical radiation pressure are correlated in a simple manner with the two distinct interaction possibilities of the obstacle and the medium i.e., interaction with the wave motion only or interaction with the wave motion as well as with the medium itself. This picture appears to be consistent with the earlier conclusions of BRILLOUIN and RICHTER. Afterwards the result is generalized for dispersive media. It is shown that the component which is usually stated to be independent of the equation of state in the existing nondispersive theories should contain the time parameters of the equation of state in the form of a multiplying factor group, velocity over phase velocity. The present paper stresses the basic concepts rather than mathematical detail and concludes with an extensive bibliography and commentary. *Subject Headings: 1. Acoustical propagation 2. Bibliographies.*—*Author's abstract.*

PART II. SELECTIVE ANNOTATED BIBLIOGRAPHY ON GENERAL OCEANOGRAPHIC METEOROLOGY

By: *Mollie P. Kramer*

INTRODUCTION

Centennial

(1853-1953)

The convening of the first international Maritime Conference at Brussels for the adoption of a uniform system of meteorological observations at sea as suggested by Matthew Fontaine Maury.

The undisputed influence of the oceans on weather and climate coupled with the growing interest being expressed by meteorologists in oceanography as the latter science "comes of age" have occasioned a series of bibliographies on oceanographic meteorology in this journal, the second and most comprehensive of which appears below.

For regional references to the **Marine meteorology and climatology of the Pacific Ocean**, see vol. 4, No. 9, Sept. 1953, *Meteorological Abstracts and Bibliography*. Similar regional studies for the Atlantic, Indian and Antarctic Oceans are in preparation. Bibliographies on the physical and dynamical aspects of oceanography as related to meteorology, specifically **Energy and mass exchange between the sea and atmosphere**, **Wind waves**, **Winds and ocean currents** and **Storm floods** will also appear in subsequent issues. Descriptive comments on the contents of and omissions from the general bibliography below follow.

Textbooks and manuals

This section is fairly exhaustive in its inclusion of those textbooks generally found in the libraries of oceanographic institutions.

Expeditions

Reference is made to the complete scientific results of each major oceanographic expedition or to selected advance articles dealing with recent expeditions (Finnish Atlantic, 1939; "Albatross," 1947-48; Maudheim, 1949-52; "Galathea," 1950-52; Project Skijump, 1951-52) in cases where the scientific results have not yet been published. Reports of research during the "Campagnes scientifiques du Prince de Monaco," the "Marion" Expedition to Davis Strait and Baffin Bay (1928), the Gulf Stream Multiple Ship Survey (1950), the cruises of the Texas Agricultural and Mechanical College research vessel "Alaska" in the Gulf of Mexico (1951-52), the investigations of the Scripps Institution of Oceanography "Crest" and "Horizon" along the California coast and other similar reports have been omitted either because they deal almost exclusively with marine biology, sedimentation, chemistry and bathymetry or because their limited geographic scope made the inclusion of such reports in the regional bibliographies on marine meteorology more meaningful. For a **chronological list of the main maritime discoveries and explorations** see the *Hydrographic Review*, Monaco, 21:130-169, 1944.

Charts and atlases

The inclusion of charts and atlases has been limited to the better known publications dealing generally with entire oceans or the world and to selected examples of the Japanese and German maritime charts. Charts of lesser geographical scope such as the K. Nederlandsch Meteorologisch Instituut **Red Sea and Gulf of Aden** (see 2J-239, Oct. 1951, *MAB*) or **Zeen rond Australia** (see D-197, April 1953, *MAB*) will be included where possible in the regional bibliographies to appear subsequently. For charts and atlases of the Pacific, see items 4I-1, -8, -25, -48, -90, -92, -136, -151, -161, -229, and -248 in Sept. 1953, *MAB*. Other well known sources of local marine meteorological data not included are the Great Britain. Hydrographic Office **Pilots** and the U. S. Hydrographic Office **Coastal pilots** and **Sailing directions** and the U. S. **Naval air pilots**. For further information on **Recent British marine meteorological and surface current atlases**, see article by J. I. Jameson in the *Marine Observer*, 21(152):115-119, April 1951. Space limitations have also made impossible the inclusion of charts and tables of sea surface temperature and salinity such as the monthly charts prepared chiefly for fishery use by the Conseil Permanent International pour l'Exploration de la Mer.

Marine meteorology

This section, constituting the largest subdivision of the bibliography, comprises what is hoped will be a representative selection of references dealing with marine influences on weather, general analogies and interrelationships between oceanography and meteorology, forecasting for ocean areas, microseisms and ocean storms, ocean weather ships and merchant marine cooperation, saline nuclei, and a few observations of meteorological elements over the sea. For example, only a limited number of references to wind over the sea are included (e.g., see 5A-136, -142, -146, -202 below) because that subject will receive fuller treatment in a future bibliography. Likewise, reference has been made to only certain outstanding articles dealing with energy exchange such as those by Jacobs (5A-176) and Sverdrup (5A-179) on energy transformation and evaporation respectively.

Periodicals

Some comments on the issuing bodies or institutions have been incorporated in the abstracts. For further information see the extensive list of oceanographic institutions, their activities, facilities and provisions for publication of results in Vaughan, *International aspects of oceanography* (5A-27). Certain periodicals such as the *Instituto Español de Oceanografía*, *Boletín*, the University of Washington, *Publications in Oceanography* or the Conseil Permanent International pour l'Exploration de la Mer, *Publicaciones de circonstance* are omitted because their subject matter is almost entirely marine biology.

Bibliographies

The Union of South Africa, Weather Bureau at Pretoria, is preparing a bibliography on Antarctic and the Southern Ocean which to our knowledge has not yet been published. References included represent a fairly random selection of regional bibliographies and a few references to lists of the contents of well known periodicals.

Major data sources

In the Outline of Contents below there will be found a section (Charts and Tabulated Data) in which all major data sources included in this bibliography have been grouped, regardless if they take the form of periodicals, expedition reports, marine atlases or whatever. The research worker should also bear in mind that over 20,000,000 marine weather observations (including German and Japanese) taken during the last century by mariners the world over are recorded on punched cards on file at the National Weather Records Center at Asheville, North Carolina. Large quantities of unpublished oceanographic and marine meteorological data are also on file at the U. S. Hydrographic Office, the Woods Hole Oceanographic Institution, the Seewetteramt in Hamburg, Germany, and at other world famous research centers.

The asterisk (*) is used to denote a good source of data, the dagger (†) a good source of references and the symbol (§) a source of synoptic material. The library symbol DN-HO identifies material most easily obtainable at the U. S. Hydrographic Office library in Suitland, Md. The symbol MWB stands for the library of the Marine Biological Laboratory (depository for the Woods Hole Oceanographic Institution) at Woods Hole, Mass., which, to our knowledge, is the only convenient source of a few of the items listed below and where almost all of them can be found. Interlibrary loans with Woods Hole can be arranged between Oct. 15 and April 15.

We wish to express our appreciation to Dr. Columbus O'D. Iselin of the Woods Hole Oceanographic Institution for his interest and guidance in the early stages of the preparation of this bibliography and to Dr. Harald U. Sverdrup, Director of the Norsk Polarinstitut, Oslo, for his valuable suggestions regarding the contents of this and ensuing oceanographic bibliographies.

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Major Expedition Reports (listed chronologically by beginning date of expedition and grouped geographically by region investigated)

Charts and Tabulated Data (comprising publications devoted exclusively to charts and data as well as noteworthy sources of charts and data in textbooks, expedition reports, etc.; grouped geographically by oceanic region and by subject according to meteorological or oceanographical element charted or tabulated)

Marine Meteorology (comprising descriptive accounts of weather and meteorology at sea; subdivided into a Subject outline by meteorological element, theory or technique discussed and a Geographic outline by region described)

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TEXTBOOKS AND MANUALS

(Arranged chronologically)

5A-1

Maury, Matthew Fontaine, **The physical geography of the sea, and its meteorology.** New York, Harper & Brothers, 1861. 8th ed. 474 p. figs., tables, 15 fold. plates. **DLC**—Frequently referred to as the first textbook of modern oceanography, MAURY's work is a classic in the field. His aim in revising successive editions was to keep abreast of research in the growing science and introduce and discard theories as they proved worthy or unworthy. MAURY's realization of the interdependence of sea and atmosphere is evident in his many-sided discussion of the "two oceans of air and water." His classic chapter on the Gulf Stream is the source of the oft quoted phrase "There is a river in the ocean." A chapter on the actinometry of the sea, so basic to sea-air energy exchange, is included. *Subject Headings:* 1. Oceanography 2. Textbooks 3. Gulf Stream.

1861

551.46(02)

5A-2

Reclus, Élisée, **The ocean, atmosphere, and life.** New York, Harper and Bros., 1873. 534 p. 207 figs., colored maps, refs. **MWB**—An early textbook presenting a comprehensive picture of basic descriptive oceanography and meteorology and the effect of the sea and atmosphere on flora, fauna and man. *Subject Headings:* 1. Textbooks 2. Oceanography 3. Meteorology.

1873

551.46(02)

5A-3

Findlay, Alex. Geo., **A textbook of ocean meteorology, compiled from the sailing directories for the oceans of the world.** London, Richard Holmes Laurie, 1887. 242 p. tables, fold. charts. **DLC**—A non-technical compilation of information on the winds and currents of the various oceans in their relation to passage from port to port. First chapter contains basic meteorological definitions and information. *Subject Headings:* 1. Marine meteorology 2. Textbooks.

1887

551.46(02)

1890

5A-4

551.5 (26) (02)

de Sugny, J., *Éléments de météorologie nautique*. [Elements of marine meteorology.] Paris, Berger, Levrault et Cie, 1890. 472 p. tables, figs., fold. charts, refs. **DWB**—Textbook for mariners with special emphasis on the general circulation and storms at sea. Climatological summaries of most frequented ocean regions included. *Subject Headings*: 1. Marine meteorology 2. Textbooks.

1899

5A-5

551.5 (26) (02)

Terry, Antonia and Suanzes, Victoriano, *Apuntes de meteorología náutica oceanografía y derrotas*. [Notes on marine meteorology oceanography and navigation.] El Ferrol, El Correo Gallego, 1899. 438 p. figs., tables, fold. charts. **DWB**—Pt. I on general marine meteorology stresses geographical peculiarities of the general circulation and wind regimes of the sea. Pt. II comprises brief notes on static and dynamic oceanography. Practical navigational problems included at end. *Subject Headings*: 1. Marine meteorology 2. Oceanography 3. Textbooks.

1902

5A-6

551.46 (02)

Krümmel, Otto, *Der Ozean. Eine Einführung in die allgemeine Meereskunde*. [The ocean. An introduction to the general knowledge of the sea.] Vienna, F. Tempsky, 1902. 2nd ed. 285 p. 111 figs. **DLC**—This well-illustrated book on oceanography is divided into four main chapters dealing fairly comprehensively with geography of the oceans, depths of the ocean, characteristics of ocean water (incl. temperature distribution) and types of motion (incl. waves, tides and currents). *Subject Headings*: 1. Oceanography 2. Textbooks.

1907

5A-7

551.46 (02)

Richard, Jules, *L'Océanographie*. [Oceanography.] Paris, Vuibert and Nony, 1907. 398 p. figs., refs. **MWB**—The first general French textbook of oceanography including description of instruments, ocean depths, currents, physical characteristics of ocean water, marine ice, and marine biology. *Subject Headings*: 1. Oceanography 2. Textbooks.

1909

5A-8

551.5 (26) (02)

Köppen, Wladimir Peter, *Grundlinien der maritimen Meteorologie, vorzugsweise für Seeleute dargelegt*. [Basic principles of marine meteorology, especially explained for mariners.] Hamburg, G. W. Niemeyer Nachfolger, 1909. 2nd ed. 83 p. 11 figs. **DWB**—Compact source of information on variation of meteorological elements, atmospheric disturbances and winds and tides at sea, and basic patterns of the general circulation. Second edition includes brief remarks on the use of kites and balloons for meteorological observations at sea and additional comments on hurricanes not found in the first. *Subject Headings*: 1. Marine manuals 2. Marine meteorology.

1911

5A-9

551.46 (02)

*Krümmel, Johann Gottfried Otto, *Handbuch der Ozeanographie*. [Handbook of oceanography.] Stuttgart, J. Engelhorn, 1907, 1911. 2 vols. 2nd ed. 526 p. 764 p. figs., tables, eqs., refs. **DLC**—Vol. I is a completely revised and enlarged version of the 1884 edition and comprises a lengthy coverage of the physical characteristics (salinity, density, temperature) of sea water and marine deposits. Vol. II, also extensively revised and enlarged to bring the theory up to date and introduce new concepts such as internal waves, includes theoretical and descriptive treatment of waves, tides and currents. Contains some of the small amount of data available on little known areas (e.g., Okhotsk Sea). *Subject Headings*: 1. Oceanography 2. Textbooks.

1913

5A-10

551.46 (02)

Murray, John, *The ocean; a general account of the science of the sea*. London, Williams and Norgate, 1913. 256 p. 12 colored plates. **MWB**—"The most concise, accurate, and complete account of all that pertained to the scientific investigation of the sea to that date. Written in simple language it is probably one of the best introductions to oceanography for the student or intelligent non-specialist." *Subject Headings*: 1. Oceanography 2. Meteorology 3. Textbooks.—W.A. Herdman.

1917

5A-11

551.46(02)

Shokal'skiĭ, Iuliĭ Mikhailovich, *Okeanografiia*. [Oceanography.] 1917. 614 p. 247 figs., tables, bibliog. p. 587-596. In Russian with French resumé appended. DLC—One of the most comprehensive early textbooks of oceanography including sections on temperature and salinity, marine ice, oceanic exploration, tides, currents (charts, measurement, influence on climate), winds at sea, sea level variations (particularly Baltic and Black Sea), ocean depths and bottom configuration, and instruments. *Subject Headings: 1. Oceanography 2. Textbooks 3. Ocean currents.*

1920

5A-12

551.46(02)

Berget, Alphonse, *Les problèmes de l'océan*. [Problems of the ocean.] Paris, E. Flammarion, 1920. 329 p. figs. DLC—A series of essays written with the goal of familiarizing readers with the wide scope of the science of oceanography and the rapid progress made during its first 50 years as a recognized field of study. *Subject Heading: 1. Oceanography.*

1921

5A-13

551.46(02)

Jenkins, James Travis, *A textbook of oceanography*. London, Constable and Co., Ltd., 1921. 206 p. col. front., 42 figs., refs., appends. DLC—First modern textbook on oceanography in English, a non-technical presentation of the outlines of the science including geographical, geological and physical (waves, tides and currents) features of the oceans. *Subject Headings: 1. Oceanography 2. Textbooks.*

1923

5A-14

551.46(02)

Herdman, William Abbott, *Founders of oceanography and their work, an introduction to the science of the sea*. New York, Green & Co., 1923. 340 p. 28 plates. DLC—Not intended to be a textbook of oceanography, HERDMAN's book is in part a series of biographical sketches of the outstanding early contributors to the field written by one who knew them personally. The balance consists of chapters devoted to selected subjects (e.g., hydrography and currents) within the field which indicate the scope of oceanography and the need for further scientific investigation. *Subject Headings: 1. Oceanography 2. Biography.*

1925

5A-15

551.5(26)(02)

Paredes y Castro, José García de, *Meteorología náutica y oceanografía*. [Nautical meteorology and oceanography.] 2nd ed. Barcelona, Fidel Giró, 1925. 414 p. 133 figs., plates, tables, append. DWB—A well indexed text of basic meteorology and oceanography with emphasis on the forecasting of meteorological elements and disturbances at sea. *Subject Headings: 1. Marine meteorology 2. Textbooks 3. Forecasting at sea.*

1928

5A-16

551.5(26)(02)

Coyecque, Marcelo, *Nociones de meteorología general náutica con elementos de oceanografía*. [Notes on general and nautical meteorology with elements of oceanography.] Barcelona, Guinart and Pujolar, 1928. 360 p. 195 figs., fold. charts, appends. DLC—A general textbook of meteorology containing sections on storms at sea (p. 240), forecasting at sea (p. 28) and a basic coverage of oceanography embracing instrumentation, sea water, marine ice, waves and currents. Information on transmission of meteorological observations at sea appended. *Subject Headings: 1. Marine meteorology 2. Textbooks.*

5A-17

551.46(02)

Johnstone, James, *An introduction to oceanography, with special reference to geography and geophysics*. London, Hodder and Stoughton, 1928. 2nd ed. rev. 368 p. illus. (incl. maps), plate, 5 fold. charts., diagrs., biblio., appends. DLC—"Although an attempt has been made here to deal in a general way with the science of oceanography, it is rather with the outlook of the student of geography and geology that the book has been written." In addition to chapters on such subjects as the geographical divisions of the oceans, ocean depth, and the sea bottom, a lengthy coverage of oceanic circulation is included in which the currents of the various oceans are discussed separately. Historically, the last chapter entitled "Secular changes in the ocean" is of great interest. *Subject Headings: 1. Oceanography 2. Textbooks 3. Ocean currents.*

1929

5A-18

551.46(02)

Defant, Albert, *Einführung in die Geophysik. III. Dynamische Ozeanographie*. [Introduction to geophysics. III. Dynamic oceanography.] *Naturwissenschaftliche Monographien und Lehrbücher*, Berlin, v. 9, 1929. 222 p. 87 figs., tables, refs., eqs. MWB—Drawing largely from his experience on the "Meteor" (see 5A-70) author presents the physical and theoretical explanations of motion in the sea. Special emphasis on general oceanic circulation and dynamics of ocean currents. *Subject Headings: 1. Dynamic oceanography 2. Textbooks.*

1930

5A-19

551.46(02)

Marmer, Harry Aaron, *The sea*. New York, D. Appleton and Co., 1930. 312 p. 45 figs. DWB—An informal, non-technical presentation of the salient features of the knowledge of the sea to date containing chapters of popular interest on such subjects as the sea of ancient times, the northwest passage, and legendary isles. *Subject Heading: 1. Oceanography.*

1931

5A-20

551.5(26)(02)

Berget, Alphonse, *Leçons d'océanographie physique: 2^{me} partie: l'océan et l'atmosphère*. [Lessons in physical oceanography: 2nd part: the ocean and the atmosphere.] *Institut Océanographique, Monaco, Annales*, New Ser., Vol. 11, 1931. 396 p. 193 figs. DLC—Chapters 1-4 deal with the chemical and optical characteristics of the atmosphere; Chapter 5 with solar radiation and Chapters 6-11 with winds and general physics of the atmosphere. Chapters 14-17 again deal with winds, storms and other atmospheric movements, by themselves and in relation to oceanic drifts and currents. Chapter 18 treats of climate as it may be related to oceanographic matters. Remainder deals with currents and drifts. Adequately illustrated. *Subject Headings: 1. Marine meteorology 2. Ocean currents.*

5A-21

551.46(02)

Bigelow, Henry Bryant, *Oceanography, its scope, problems and economic importance*. New York, Houghton Mifflin Co., 1931. 263 p. DLC—"The book is an attempt to appraise the present (1931) condition of oceanographic research with reference to the more outstanding problems, so as to take bearings for future research. It is in no sense a textbook or compendium." Of special interest to meteorologists is Chap. 4 (by CHARLES F. BROOKS) on the relationship between oceanography and meteorology and the excellent section 5 of Chap. 6 dealing with oceanography and seasonal weather forecasting. Emphasis is laid on the difficulty of the problem of establishing "beyond reasonable doubt whether, or in what parts of the ocean, temperature abnormalities or other changes in the water do actually antedate alterations in the weather of the overlying air with regularity." *Subject Headings: 1. Marine meteorology 2. Long range forecasting 3. Sea temperatures. I. Brooks, Charles F.*

1932

5A-22

551.46(02)

Schumacher, A., *Ozeanographie*. [Oceanography.] *Handwörterbuch der Naturwissenschaften*, Jena, vol. 7:529-561, 1932. 2nd ed. 20 figs., refs., eqs., tables. MWB—A useful reference work treating briefly the broad principles of the subject. Gain and loss of heat by the sea, distribution of temperature and its seasonal changes, relative amounts of precipitation and evaporation, and formation of ice are treated at some length. Sections on currents and waves included. *Subject Headings: 1. Oceanography 2. Heat exchange sea-atmosphere.*

1935

5A-23

551.5(26)(02)

Great Britain. Meteorological Office, *A handbook of weather, currents and ice for seamen*. Great Britain, Meteorological Office, 1935. 154 p. 34 figs., tables, append. DLC—A well indexed and illustrated handbook containing brief chapters on general marine meteorology, tropical cyclones, winds, currents, ice and ocean pilotage. Instrument correction tables, Beaufort Scale and humidity tables appended. *Subject Headings: 1. Marine manuals 2. Marine meteorology.*

5A-24

551.5(26)(02)

*Italy. Istituto Idrografico, *Manuale de meteorologia nautica*. [Manual of marine meteorology.] 1935. 2nd ed. 290 p. 81 figs., 10 tables. DLC—First part deals with the basic meteorological elements, and periodic and non-periodic variations of the weather. Part two emphasizes the applications of meteorology to marine navigation and includes discussions of shipboard instru-

ments and observational techniques, sources of meteorological information for the navigator, and weather forecasting at sea. Reduction and conversion tables included as well as an English-Italian glossary of meteorological terms. *Subject Headings:* 1. **Marine manuals** 2. **Marine meteorology** 3. **Glossaries.**

5A-25

551.5 (26) (02)

†*Schott, Gerhard, **Geographie des Indischen und Stillen Ozeans.** [Geography of the Indian and Pacific Oceans.] Hamburg, C. Boysen, 1935. 413 p. 114 figs., fold. map, 37 tables, refs. **DWB**—A comprehensive coverage of all phases of the geography of the area. Of special interest to meteorologists is Chap. 6 on the chief meteorological and oceanographical characteristics of the surface waters of the two oceans. A series of detailed, colored charts fully illustrate the text. Unannotated (30-60 items) bibliographies chiefly in German and English included; p. 171, The chief meteorological and oceanographical qualities of the surface of the Indian and Pacific Oceans; p. 256, The natural regions of the Indian Ocean; p. 326, The natural regions of the Pacific Ocean. (*Same item* as 4I-93, Sept. 1953, *MAB.*) *Subject Headings:* 1. **Ocean climates** 2. **Marine meteorology** 3. **Textbooks** 4. **Bibliographies** 5. **Pacific Ocean** 6. **Indian Ocean.**

1937

5A-26

551.5 (26) (02)

§Brown, Charles H., **Meteorology for masters and mates.** 8th ed. Glasgow, Brown, Son and Ferguson, 1937. 240 p. figs., tables, fold. maps. **DLC**—This textbook of meteorology devotes special attention to those subjects of particular marine significance such as construction and use of instruments, ocean storms, currents and ice. The International Convention Code, instructions for constructing weather maps and a glossary are included. *Subject Headings:* 1. **Marine meteorology** 2. **Textbooks.**

5A-27

551.46 (02)

Vaughan, Thomas Wayland, **International aspects of oceanography.** Washington, D. C., National Academy of Sciences, 1937. 225 p. 10 figs., tables, 36 plates (incl. fold. charts). **DWB**—A unique and valuable study sponsored by the National Academy and comprising a summary (chiefly in chart form) of the degree of physical exploration to date in the various oceans and a catalog of institutions (research and educational) engaged in oceanographic work. Numerous charts show structure of ocean basins, temperature, salinity, density and tides. Data unanalyzed. *Subject Headings:* 1. **Oceanography** 2. **Oceanographic institutes.**

1938

5A-28

551.5:656.6 (02)

§Petterssen, Sverre and Spinnagr, Finn, **Meteorologi for sjøfolk.** [Meteorology for seamen.] Bergen, John Griegs Forlag, 1938. 160 p. 88 figs. (incl. 9 synoptic charts), 11 tables. Issued in pocket, a booklet by Sverre Petterssen and John Gasland entitled: **Vaermeldinger for skibsfarten.** [Weather reports for navigation.] 86 p. 5 figs., codes, symbols, 26 tables, 14 indices of meteorological stations. **DLC**—A well-illustrated and modern text (in Norwegian) on meteorology for mariners. The greater part of the book is concerned with air masses, fronts, cyclones, anticyclones, weather analysis and forecasting, tropical storms and actual case histories of synoptic situations illustrated by a score of analyzed charts for the North Atlantic. A supplementary handbook is included which gives the basic data for international marine weather reporting networks, communications and codes (now obsolete). A minimum of space is devoted to orthodox treatment of the atmosphere, instruments, clouds, wind, etc. (*Same item* as 5-11, May 1950, *MAB.*) *Subject Headings:* 1. **Marine meteorology** 2. **Synoptic analysis** 3. **Textbooks.** I. Gasland, John.—*M.R.*

1940

5A-29

551.5 (26) (02)

Defant, A., Kuhlbrodt, E., Roll, U. and others, **Wind, Wetter und Wellen auf dem Weltmeere.** [Wind, weather and waves on the oceans of the world.] Berlin, E. S. Mittler & Sohn, 1940. 150 p. 59 figs., 16 plates. **DLC**—A compilation of short studies by six of Germany's outstanding scientists giving a picture of the relationships of ocean and atmosphere, a view of ocean climate as investigated by new aerological methods, and an illustrated account of the size and behavior of storm waves. *Subject Headings:* 1. **Marine meteorology** 2. **Ocean climates** 3. **Oceans.** I. Seilkopf, Heinrich II. Thorade, H. III. Wüst, Georg.

5A-30

551.5 (26) (02)

Rouch, Jules Alfred, **Météorologie et physique du globe. Vol. I, Météorologie nautique. Vol. II, Physique des mers.** [Meteorology and physics of the globe. V. I, Marine meteorology.

V. II, Physics of the ocean.] Paris, Société d'Éditions Géographiques, Maritimes et Coloniales, 1940/1941. 2 v. tables, figs., plates. Note: A 2nd rev. and enlarged edition of vol. 1 was published in 1950 by the same publisher. **DLC**—A brief but comprehensive coverage of marine meteorology (vol. 1) and physical oceanography (vol. 2). Atmospheric structure, instruments for observations at sea, weather forecasting at sea, interpretation of the marine weather map, storm types and movement, optical phenomena at sea, measurement and description of ocean water salinity, density and temperature, waves, tides and currents, terrestrial magnetism and atmospheric electricity are among the main topics discussed in the two volumes. The 1950 edition of vol. I contains some upper air information not included in the first edition. *Subject Headings:* 1. Marine meteorology 2. Oceanography 3. Textbooks.

1942

5A-31

551.5(26)(02)

†*§Sverdrup, Harald Ulrik, **Oceanography for meteorologists**. New York, Prentice-Hall, Inc., 1942. 246 p. 70 figs., 4 charts, refs. **DLC**—Author describes methods used in physical oceanography and summarizes our present knowledge of the current systems of the oceans and of the processes that maintain them. From this book a meteorologist can readily obtain information as to the findings in physical oceanography that have bearing upon problems of the atmosphere. Emphasis laid on the importance of dealing with the entire system, comprising atmosphere and oceans, when studying the circulation of the atmosphere. *Subject Headings:* 1. Oceanography 2. Marine meteorology 3. Textbooks.

5A-32

551.46(02)

†Sverdrup, Harald Ulrik; Johnson, Martin W. and Fleming, Richard H., **The oceans, their physics, chemistry and general biology**. New York, Prentice-Hall, Inc., 1942. 1087 p. 265 figs., 126 tables, 7 fold. charts, eqs., bibliogs. **DLC, DWB**—The most outstanding comprehensive textbook of oceanography embracing all phases of the science of the sea. An exceptional number of fine illustrations and lengthy bibliographies, worldwide in scope, accompany each chapter. Seven folding charts of bottom topography, salinity, temperature and surface current distribution and detailed subject and author indexes complete this unique and monumental study of the oceans. Bibliographies included are as follows: p. 45-46, The earth and the ocean basins; p. 93-97, Physical properties of sea water; p. 150-152, Distribution of temperature, salinity, density; p. 163-164, Distribution of variables in the sea; p. 222-227, Chemistry of sea water; p. 263-266, Organisms and the composition of sea water; p. 284-285, The sea as a biological environment; p. 328-330, Populations of the sea; p. 385-388, Observations and collections at sea; p. 430, Statics and kinematics; p. 511-515, Dynamics of ocean currents; p. 602-604, Waves and tides; p. 755-761, The water masses and currents of the oceans; p. 795-798, Phytoplankton and physical-chemical environment; p. 873-878, Animals and physical-chemical environment; p. 920-924, Interrelations of marine organisms; p. 944-945, Organic production in the sea; p. 1045-1049, Marine sedimentation. *Subject Headings:* 1. Oceanography 2. Textbooks 3. Bibliographies.

5A-33

551.501(26)

†U. S. Maritime Service Institute, **Marine meteorology, Pts. 1-2**. [1942.] 2 pieces. forms (some fold.), refs., bibliog. Mimeo. **DWB**—A collection of 14 laboratory or text assignments with questions, official instructions and maps as an aid in the preparation of marine weather observations. *Subject Headings:* 1. Marine meteorology 2. Laboratory manuals.—A.A.

1944

5A-34

551.5:551.46(261/4)

Schott, Gerhard, **Geographie des Atlantischen Ozeans**. [Geography of the Atlantic Ocean.] 3rd ed. Hamburg, C. Boysen, 1944. 438 p. 141 figs., 27 col. plates, refs. (1st ed. pub. in 192.) **DLC**—According to the author, this third and latest edition is a "new book" almost completely rewritten and vastly improved over earlier editions by the inclusion of charts based on data from the "Meteor" (1925-27) and other oceanographical expeditions. One of the author's prime aims is to show the dynamic interrelation between ocean and atmosphere. A new section containing aerological data up to 4000m above the sea surface has been added to the chapter (VI) entitled "Chief characteristics of the atmosphere over the Atlantic Ocean." Lengthy, well illustrated chapters on the history, physical and human geography, geology, climatology and marine biology of the Atlantic combine to make SCHOTT's work a monumental and comprehensive regional study. (Same item as 3.8-14, Aug. 1952, MAB.) *Subject Headings:* 1. Marine climatology 2. Textbooks 3. Ocean climates 4. Atlantic Ocean.

5A-35

551.5(26):629.133

U. S. Navy. Naval Air Technical Training Command, **Climate and weather for flight in naval operational zones**. Washington, Office of the Chief of Naval Operations, 1944. 200 p. 187 figs., tables, glossary. **DLC**—A training manual for naval air pilots arranged in such way as to give them a picture of the general climatic pattern of the ocean and coastal areas over which they fly, of the weather hazards and helps to aviation peculiar to specific regions, and of typical weather situations they might expect to encounter taking into account season, air mass and frontal characteristics, prevailing winds, ocean currents and topographic influences. *Subject Headings:* 1. Marine manuals 2. Marine meteorology 3. Aeronautical meteorology.

1945

5A-36

551.5(26)(02)

Stewart, John Q., **Coasts, waves, and weather**. Boston, Ginn & Co., 1945. 348 p. figs., photos, charts, biblio. p. 340-342. **DPL**—A well-illustrated book designed primarily to "explain to marine and air navigators the physical environment in which navigation must be carried on." Pts. II and III are entitled, respectively, "Oceanography for navigators" and "Meteorology for navigators." *Subject Headings:* 1. Marine meteorology 2. Textbooks 3. Ocean waves 4. Ocean currents 5. Sea ice.

5A-37

551.46(02)

Stommel, Henry, **Science of the seven seas**. New York, Cornell Maritime Press, 1945. 208 p. illus., bibliog. p. 200-201. **DLC**—A small, well-illustrated handbook which describes, lists and explains in elementary fashion some of the natural phenomena observed at sea. *Subject Headings:* 1. Oceanography 2. Marine meteorology 3. Textbooks.

5A-38

551.311.1811

*†Zubov, N. N., **L'dy Arktiki**. [Arctic ice.] Moscow, Glavsevmorput. Izdat., 1945. 360 p. 195 figs., 121 tables, 179 refs. **DPL, DLC**—A comprehensive treatise on the physical and chemical properties of sea waters, the processes changing the temperature and salinity of the ocean, the processes forming water masses, the interaction between the ocean and atmosphere and the formation of properties and behavior of the ice of the Arctic Ocean. The individual chapters are as follows: 1) Some characteristics of sea water; 2) Change of temperature and salinity of the ocean; 3) Mixing of waters of the oceans; 4) Ice formation and ice characteristics in the sea; 5) Physical and chemical characteristics of sea ice; 6) Growth of ice; 7) Deformation of ice; 8) Melting of sea ice; 9) Ebb and flow phenomena and ice; 10) Lee currents and ice; 11) Wind and ice drift; 12) Circulation of waters and ice of the Arctic Ocean, and 13) Seasonal and secular variations of ice distribution. The treatment is theoretical, mathematical and descriptive. There are numerous equations, diagrams, statistical data and illustrations. *Subject Headings:* 1. Sea ice 2. Energy exchange sea-atmosphere 3. Arctic Ocean.—I.L.D.

1947

5A-39

551.46(02)

Coker, Robert Erwin, **This great and wide sea**. Chapel Hill, N. C., Univ. of North Carolina Press, 1947. 325 p. 91 plates, 2 tables, 23 figs., refs., bibliog. p. 301-302. **DLC**—A relatively brief, comprehensive and non-technical presentation of some of the basic phenomena of the ocean as a place of life for plants and animals. Emphasis laid on the unity of the seas as they constitute a single dynamic mechanism worldwide in operation and influence. Well illustrated with photographs. No marine meteorology. *Subject Headings:* 1. Textbooks 2. Oceanography.—From author's preface.

5A-40

551.5(26)

†Dominguez-Aguirre, Ernesto, **Meteorología náutica**. [Marine meteorology.] Veracruz, Mexico, 1947. 316 p. 93 figs., fold. charts, tables, eqs. **DLC**—A clearly illustrated textbook of marine meteorology containing a classified bibliography and a glossary of meteorological terms in Spanish. Nine of the 50 chapters deal with storms, in particular as they influence navigation. *Subject Headings:* 1. Textbooks 2. Storms at sea 3. Glossaries.

5A-41

551.46(02)

†Zubov, Nikolai Nikolaevich, **Dinamicheskaya okeanologiya**. [Dynamic oceanology.] Moscow, Gidromet. Izdat., 1947. 430 p. 229 figs., 56 tables, bibliog. (130 refs.) p. 423-426, eqs. **DLC**—The author, as head of the Institute of Oceanology in the Hydrometeorological Service, approached the subject of dynamic oceanography from the point of view of the researcher rather than the practical hydrographer or oceanographic meteorologist. After discussing the structure and physico-chemical characteristics of sea water, and the various surfaces and forces operating in the ocean, he takes up

the exchange or mixing of water masses, then waves, tides, tidal phenomena and ice, ocean currents, wind and movements of ice, variations in sea level, and finally there are 40 pages on the interaction of the sea and atmosphere. (*Same item as 2-185, Feb. 1950, MAB.*) *Subject Headings:* 1. Oceanography 2. Textbooks 3. Energy exchange sea-atmosphere 4. Bibliographies.—*M.R.*

1949

5A-42

551.5:656.6 551.46(02)

Bossen, P. and Zee, P. Van der, **Maritieme meteorologie en oceanografie**. [Maritime meteorology and oceanography.] 8th ed. Amsterdam, Kweekschool voor de Zeevaart, 1949. 312 p., 102 figs., 15 charts. Issued in pocket as appendix, a separate booklet entitled: **Omschrijvingen, codecijfers en symbolen nodig bij invullen van het meteorologisch journaal en de weerkaart op zee**. [Definitions, code numbers and symbols for use in meteorological logs and weather charts at sea.] 24 p. codes, symbols. **DLC**—A substantial text in the Dutch language, covering the basic principles of meteorology, climatology and oceanography, and even some of the more advanced theoretical aspects which would be interest to the marine observer or navigator. The greatest attention is paid to storms (hurricanes, cyclones, squalls, etc.), wind systems (trades, monsoons, doldrums), and to marine observations. This eighth edition contains a supplement giving the details of the latest (Toronto) marine code, and some sample synoptic charts drawn according to recent methods of air mass analysis. (*Same item as 8-3, Aug. 1950, MAB.*) *Subject Headings:* 1. Marine meteorology 2. IMO Marine Code, 1949 3. Textbooks 4. Netherlands.—*M.R.*

5A-43

551.5(26):629.12(02)(03)(481)

Johnsen, Olaf and Bryn, Zacharias, **Meteorologi og oceanografi for sjøfolk**. [Meteorology and oceanography for seamen.] 8th ed. Arthur Stene (ed.). Oslo, Aschehoug, 1949. 194 p. 7 plates (folded), 102 figs., tables. English-Norwegian Glossary, p. 189-190. First published 1920 under the title: "Kortfattet meteorologi og oceanografi for sjøfolk." **DLC**—A revision of the seventh edition (1943) of a standard textbook for use in Norwegian schools of marine navigation. The meteorological part covers the general principles of meteorology, instruments, movement of air masses and fronts, observational techniques, weather codes and charts, their construction and analysis, climatology of oceans and coastal areas, winds, monsoons and hurricanes. The section on oceanography deals mainly with methods of observing currents, waves, ice, temperatures and depths, and characteristics of the main sea routes of the world. A glossary of 130 English-Norwegian terms used in meteorology is appended. The illustrations and sample synoptic charts are excellent. (*See also item 5-11, May 1950, MAB.*) *Subject Headings:* 1. Marine meteorology 2. Marine navigation 3. Textbooks 4. Glossaries 5. Norway. I. Stene, Arthur (ed.) II. Dannevig, Petter.—*M.R.*

5A-44

551.501.1(26)(02)

*Netherlands. Meteorologisch Instituut, **Handleiding voort het verrichten van meteorologische waarnemingen op zee**. [Handbook for making meteorological observations at sea.] 2nd rev. ed. Gravenhage, Staatsdrukkerij- en Uitgeverijbedrijf, 1949. 119 p. 7 tables, 9 figs., photos. (mostly with English legends), refs. Netherlands. Meteorologisch Instituut, [Uitgave], No. 118a. **DLC**—Includes discussion of currents, air pressure, wind, air and sea temperature, humidity, waves, fog and precipitation, cloudiness, visibility, and state of the weather. In addition observations of particular oceanographic meteorological, biological, optical, magnetic, and astronomic quantities are discussed. Correction, reduction and psychrometer tables are included. *Subject Headings:* 1. Marine meteorology 2. Marine manuals.

5A-45

551.465(02)

Shuleikin, Vasilii V., **Ocherki po fizike moria**. [Outlines of the physics of the sea.] Moscow, Akademiia Nauk, 1949. 334 p. 190 figs. **DLC**—A readable yet scholarly presentation of the basic problems of oceanography, with many excellent illustrations (both photographic and schematic) of scores of instruments used in oceanography and hydrography, as well as charts, pertinent scenes, etc. A long chapter at the beginning traces the history of the science from the earliest voyages to the present, with emphasis on instrumentation. The arrangement of the material follows a rational pattern: 1) the sun as source of energy for the atmospheric and oceanic movements, 2) heat or energy exchange in the sea, 3) effect of oceans on continents, 4) recurrent phenomena in the hydrologic cycle, 5) cause or mechanism of ocean currents, 6) wave phenomena, 7) tides, 8) optical and 9) acoustical properties of the sea, and, finally, some problems of marine biology and fisheries. A great deal of original material and research is presented in this smaller and more popular edition of the author's voluminous work "Fizika moria" (Physics of the sea) (*see item 2-184, Feb. 1950, MAB*). The author is now chief of the Hydro-meteorological Service of the U.S.S.R. and a member of the Akademiia Nauk. (*Same item as 8-148, Aug. 1950, MAB.*) *Subject Headings:* 1. Oceanography 2. Hydrography 3. Textbooks.—*M.R.*

5A-46

551.5(26)(02)

†Somma, Alberto, **Elementi di meteorologia ed oceanografie. Parte Prima, Meteorologia. Parte Seconda, Oceanografia.** [Elements of meteorology and oceanography. Part I, Meteorology. Part II, Oceanography.] Padua, Casa Editrice Dott. Antonio Milani, 1949, 1952. Pt. I. 457 p. 197 figs., 37 refs. Pt. II, 758 p. 322 figs., 84 refs. **DLC**—A two volume treatise on meteorology and oceanography and their interrelationships. Pt. I, comprising the usual textbook chapters on the various meteorological elements, solar radiation, mechanics and thermodynamics of the atmosphere, atmospheric disturbances, circulation, electricity and optics, and forecasting is characterized by a decided emphasis on application to marine navigation. Append. C, p. 446-450, contains information on weather ships. Pt. II is devoted to the physical characteristics of water, waves, tides and ocean currents. *Subject Headings:* 1. Marine meteorology 2. Oceanography 3. Textbooks.

1950

5A-47

551.5:656.6(02)

Burgess, C. R., **Meteorology for seamen.** Glasgow, Brown, Son and Ferguson, 1950. 252 p. illus. **MH-BH**—Pt. I, general theory of meteorology. Pt. II, climates of the oceans, including air masses. Pt. III, weather forecasting. Pt. IV, observing and recording the weather. (Same item as 10-5, Oct. 1950, *MAB*.) *Subject Headings:* 1. Marine meteorology 2. Textbooks.

5A-48

551.46(02)

Colman, John S., **The sea and its mysteries.** London, G. Bell & Sons, Ltd., 1950. 285 p. 36 figs., 16 plates. **DLC**—The general principles of marine science, physical and biological, are set forth and discussed in a fairly elementary fashion. Accurate material on wave motion, winds, and ocean currents is included. *Subject Headings:* 1. Oceanography 2. Textbooks 3. Ocean waves 4. Ocean currents.

5A-49

551.501.1(26)(02)

Great Britain. Meteorological Office, **Marine observer's handbook.** 7th ed. London, H.M. Stationery Office, 1950. 122 p. 32 figs., 22 cloud photos, 18 tables. M.O. 522b. **MH-BH**—The standard book of instructions in British practice. Pt. I. Instrumental observations. Pt. II. Non-instrumental observations (including estimation of cloud height, ocean waves, currents and ice). Pt. III. Phenomena, meteorological, miscellaneous (aurora, magnetic storms, radio phenomena), astronomical. Pt. IV. Meteorological work at sea, including organization of voluntary ships' reports and International Convention for the Safety of Life at Sea, 1948. Tables include correction and reduction of barometers and conversion of units, diurnal variations of pressure, humidity tables and conversion of apparent wind force and direction to true. This is the first part of the new series of "Manuals" planned by the Meteorological Office to reach publication. See companion volume, "Meteorology for mariners," published by the Great Britain Meteorological Office, for the theory and application of meteorology to the seaman's profession. (Same item as 2.2-11, Feb. 1951, *MAB*.) *Subject Headings:* 1. Marine manuals 2. Instruction for observers.

5A-50

551.501.1(26)(02)

*U. S. Weather Bureau, **Manual of marine meteorological observations.** U. S. Weather Bureau, Circular M, 1950. 8th ed. 100 p. tables, chart. **DWB**—Contains codes, procedures and observational techniques suggested by the U. S. Weather Bureau for meteorological observations at sea. *Subject Headings:* 1. Marine meteorology 2. Marine manuals.

1951

5A-51

551.5(02)(26)

Donn, William L., **Meteorology with marine applications.** 2nd rev. ed. New York, McGraw-Hill, 1951. 465 p. figs., table, refs. **DWB**—The chief revision which appears in the 2nd ed. is the rewriting of Chap. 12 which contains the 1949 IMO Marine Code in great detail, and a sample of the Weather Bureau's new form for recording ships' observations in this code. Station models for synoptic charts and other revisions up to Aug. 1950 are also included. The remainder of the book is much the same as the first edition (see item 212-4, Feb. 1951, *MAB*), with emphasis on modern concepts of synoptic meteorology, air masses and fronts, and considerable space devoted to oceanographic aspects and marine climates. (Same item as 3.8-13, Aug. 1952, *MAB*.) *Subject Headings:* 1. Marine meteorology 2. I.M.O. Marine Code, 1949 3. Textbooks.—M.R.

5A-52

551.46(02)

*†Groen, P., **De wateren der Wereldzee.** [The waters of the oceans.] Amsterdam, C. De Boer, Jr., 1951. 375 p. 148 figs., 4 maps, 52 plates, 25 tables, bibliog. p. 367-370. **DLC**—A beautifully

illustrated (photos) textbook of oceanography primarily descriptive in approach. Major subdivisions include oceanic exploration, physical qualities of sea water, marine ice, waves, tides, and mass and heat balance of the oceans. Bibliography contains numerous references arranged chronologically and grouped by subject matter. Alphabetical author and subject index included. *Subject Headings:* 1. Oceanography 2. Textbooks.

5A-53

551.46(02)

†Snezhinskiĭ, V. A., *Prakticheskaja okeanografiia (raboty v otkrytom more)*. [Practical oceanography (for work in the open ocean).] Leningrad, Gidromet. Izdat., 1951. 599 p. 371 figs., 37 tables, 140 refs. **DLC**—Recent and practical textbook on methodology of oceanographic research, with emphasis on work of Russian or Soviet scientists. The history of various types of investigations of the seas, stations, expeditions; cross sections, basic observations, methods and accuracy of observations are given due attention, but the main part or the work (and illustrations) deals with instruments—apparatus for physical, chemical and biological observations in the oceans. The text is divided into six main parts comprising 17 chapters. The first part deals with organization, preparation and completion of oceanographic work; Pt. II with oceanographic sounding equipment of four general types; Pt. III with soundings; Pt. IV with movements of sea water; Pt. V with temperature, salinity and transparency (optics) of sea water and Pt. VI with studies of ocean-atmosphere energy exchange. The last part contains two chapters, one on actinometric observations at sea and one on evaporation and convective heat exchange. The instruments and devices used by Russian oceanographers, the calibration and accuracy of the instruments and the recording and computation of results are all described and illustrated in great detail. (*Same item as 3.11-8, Nov. 1952, MAB.*) *Subject Headings:* 1. Oceanographic instruments 2. Oceanographic observations 3. Soviet science 4. Textbooks.—*M.R.*

5A-54

551.5:551.46(02)

†Vercelli, Francesco, *Il mare—i laghi—i ghiacciai*. [Ocean, lakes, glaciers.] Turin, Unione Tipografico-Editrice Torinese, 1951. 622 p. numerous photos, figs., charts, bibliog. p. xiii-xvi. Review in Italian by A. Vatova, *L'Idrosfera e le sue condizioni*. [The hydrosphere and its conditions.] [1952] available at DWB. **DLC**—A comprehensive, popularly written and profusely illustrated coverage of physical and dynamic oceanography, marine meteorology and morphology, sedimentation, limnology, snow and ice forms and glaciers. Chap. 5 includes discussion of evaporation, heat exchange and effects of ocean and atmosphere on one another. Other manifestations of ocean-atmosphere interaction discussed in Chap. 9 (waves) and Chap. 10 (circulation). This is believed to be the first attempt at so broad, voluminous and vivid a coverage of the many aspects of oceanographic, limnological and glaciological activity enumerated above. A few colored charts and a number of tables and graphs giving quantitative data on each of the topics covered give the work a superficial resemblance to SCHOTT's classical works on the geography of the Atlantic and of the Pacific and Indian Oceans. *Subject Headings:* 1. Oceanography 2. Marine meteorology 3. Textbooks 4. Ice 5. Glaciers. I. Vatova, A.—*M.R.*

1952

5A-55

551.5(26)(02)

Krauss, Joseph (*Bad Schwartau*) and Stein, Walter (*Bremen*), *Wetter- und Meereskunde für Seefahrer*. [Weather and oceanography for mariners.] 3rd rev. ed. Berlin, Springer, 1952. 171 p. 76 figs., 3 tables (folded in pocket). **DLC**—The first edition of this textbook or handbook of marine meteorology was issued in 1917 by KRAUSS under the title "Grundzüge der maritimen Meteorologie und Ozeanographie." The second edition appeared in 1931. The present edition brings the material on weather map preparation, meteorological codes and reports up to date by incorporating the latest ideas on frontal analysis and the results of the I.M.O. code which became effective Jan. 1, 1949 into the appropriate chapters. The service of the ocean weather ships in the Atlantic and Pacific, the station started in 1949 at Eismitte, Greenland, the service for marine interests which the Deutscher Seewetterdienst (Hamburg) maintains in the North Sea Region, and the ice warning service in the Baltic and Straits around Denmark, are described in some detail and illustrated with appropriate charts. A good portion of the work deals with currents, current observations, meteorological navigation and ice conditions. Meteorological material is of the type found in all texts on marine meteorology, though this work gives more concrete examples and is well organized for use as a handbook. The important rules or passages which would be most often referred to are marked by heavy black lines in the margin. Examples are given of both the German form of ship weather observation log, and the form they use for coding the 6-hourly reports for International Broadcast (1944 code). *Subject Headings:* 1. Marine meteorology 2. I.M.O. Marine Code, 1949 3. Ice patrol service 4. Textbooks. I. Meldau, H.—*M.R.*

5A-56

551.5(26) 551.582

*Tannehill, Ivan Ray, **Weather around the world**. 2nd ed. Princeton University Press, 1952. 212 p. 59 figs., 5 tables, refs. **DWB**—This "general introduction to world weather for the layman" is written with a definite marine meteorological slant. Opening with a chapter on wind and waves, the author goes on to describe other standard meteorological phenomena never losing sight of the interrelationship of sea and atmosphere. Weather characteristics of ten geographic regions of the world are outlined and considerable temperature, humidity, precipitation and cloudiness data appended. The second edition differs from the first by the inclusion of a final chapter on weather aloft. (*Same item as 3.10-15, Oct. 1952, MAB.*) *Subject Headings: 1. Marine meteorology 2. World climate.*

1953

5A-57

551.509.1(26)(02)

U. S. Weather Bureau, **Weather service for merchant shipping**. 3d ed. Wash., D. C., July 1953. 67 p. diagrs., forms. **DWB**—Schedules of principal marine weather broadcasts for all major ocean areas of the world for which such service is available. Time of transmission, call sign, radio frequency and time of observation is given, as well as the type of current reports. Charts for selected regions show forecast areas. *Subject Heading: 1. Marine weather service.*

5A-58

551.46(02)

†Proudman, Joseph, **Dynamical oceanography**. London, Methuen, 1953. 409 p. diagrs., tables, eqs., refs. Review by H. Stommel in *Science*, 118(3065):365, Sept. 25, 1953. **DLC**—First textbook in English devoted to *theoretical* oceanography. The dynamical nature of all the chief kinds of water movements are elucidated and their characteristic relationships demonstrated. Included are chapters on gravity, pressure, turbulence, internal friction, thermodynamics (Chap. 10, unique in oceanographic literature), seiches, progressive waves, and tides. Starting from the fundamental principles of dynamics and of thermodynamics, with the physical properties of sea water, and assuming the conditions which arise outside the ocean, deductions are made relating to the movement of the waters of the ocean. Most of the mathematical parts of the book (kept basic for sake of readers with little mathematical knowledge) refer to conditions which have been ideally simplified, but the theoretical relationships deduced are compared with corresponding relationships based on observations made at sea. A detailed table of contents, author and subject indexes, historical summaries and bibliographies at the end of each chapter add considerably to the book's value as a reference work. *Subject Headings: 1. Textbooks 2. Dynamic oceanography.* I. Stommel, H.—*From author's introduction.*

MAJOR EXPEDITION REPORTS

(Arranged chronologically)

5A-59

551.46:91.04 551.506.5(26)

*Report on the scientific results of the voyage of H.M.S. Challenger during the years 1873-76 under the command of Captain George S. Nares . . . and the late Captain Frank Tourle Thomson, R.N. Prepared under the superintendence of the late Sir C. Wyville Thomson . . . and now of John Murray. Edinburgh, H. M. Stationery Office, 1880-1895. 50 v. Edited by the Challenger Office. figs., tables, charts. **DLC**—A monumental series of large volumes, chiefly zoological but containing also the most extensive meteorological and oceanographical data available to that date. The "Challenger," a pioneer ship in oceanographic work, furnished data for a general map of the ocean basins, their main contour lines, and deep and bottom temperatures; located the exact position of many islands and rocks, determined currents at the surface and at various depths and collected invaluable quantities of marine life data and samples. Daily meteorological observations Dec. 1872-May 1876 are tabulated on pages 305-744 of [Pt. I.] Narrative, Vol. II. [Pt. II.] Physics and Chemistry, Vol. II, Pt. II contains a "Report on atmospheric circulation" by A. BUCHAN, based on Challenger observations 1872-1876 and other meteorological observations. *Subject Headings: 1. Challenger Expedition, 1872-1876 2. Expeditionary climatic data 3. Oceans. I. Great Britain. Challenger Office II. Buchan, Alexander.*

5A-60

551.506.5(98)

*Den Norske Nordhavsexpedition, 1876-1878. [The Norwegian North-Atlantic Ocean Expedition, 1876-1878.] Christiania, Grøndahl & Søn, 1880-1901. 7 v. in 28 pts. illus., plates, maps, tables. **DLC**—Scientific reports of an expedition sponsored by the Norwegian government for a physical and biological exploration of the waters between Norway, Iceland, Jan Mayen and West Spitsbergen, carried out in the "Vøringen," under the leadership of Capt. C. WILLE. The seven

volumes comprise 28 parts, by various authors with text in both English and Norwegian. Vol. 2, No. 1 (pub. 1883) by H. MOHN is entitled "Meteorology" and contains the tabulated meteorological observations (wind, pressure, temperature, humidity, cloudiness, precipitation amount and type, state of sea) of the expedition. Pt. 2 of the same volume by MOHN (1887) is entitled "The North Ocean, its depths, temperature and circulation." *Subject Headings:* 1. "Vöringen" Expedition, 1876-1878 2. Oceanographic expeditions 3. Arctic Ocean 4. North Atlantic. I. Mohn, Henrik (ed.) II. Sars, Georg Ossian (ed.).

5A-61

551.46:91.04

*Wissenschaftliche Ergebnisse der Deutschen Tiefsee-Expedition auf dem Dampfer "Valdivia" 1898-1899. Jena, Gustav Fischer, 1902-1940. 24 v. figs., maps, plates, tables. DLC—Volume 1, "Oceanographie und Maritime Meteorologie," of this long series is devoted to an account by GERHARD SCHOTT of the oceanographical and marine meteorological observations aboard the German vessel "Valdivia" in the Atlantic and Indian Oceans. Included are a well illustrated textual discussion, an atlas of 40 plates, charts, explanations of instruments, and numerous tables, temperature diagrams and profiles. Remainder of the series is largely marine biological. *Subject Headings:* 1. Deutsche Tiefsee Expedition, 1898-99 2. Expeditionary climatic data 3. Oceanographic data 4. Atlantic Ocean 5. Indian Ocean. I. Schott, Gerhard II. Chun, Karl (ed.).

5A-62

551.506.5(98)

*Norske Videnskaps Akademi i Oslo, Report of the Second Norwegian Arctic Expedition in the "Fram" 1898-1902. Kristiania, T. O. Brøgger, 1907-1930. 5 v. figs., tables, plates, fold. charts, maps. DLC—Among the varied scientific treatises which comprise the results of the second "Fram" expedition is a lengthy tabulation by H. MOHN (v. I, No. 4) of the extensive meteorological data collected at Rice Strait (78°45.7'N, 74°56.5'W; Sept. 1898-July 1899), Havnefjord (76°29.4'N, 24°3.7'W; Oct. 1899-Aug. 1900), Gaasefjord (76°48.9'N, 88°39.5'W; Sept. 1900-Aug. 1901; 76°29.8'N, 88°38.3'W; Sept. 1901-July 1902) and on shipboard in the Arctic and the North Atlantic in the interim periods. *Subject Headings:* 1. "Fram" Expedition, 2nd, 1898-1902 2. Expeditionary climatic data 3. Arctic expeditions 4. Arctic Ocean. I. Mohn, H.

5A-63

551.46:91.04

*Die Deutsche Südpolar-Expedition auf dem Schiff "Gauss" unter Leitung von Erich von Drygalski, Aug. 1901-April 1902. Berlin. Universität. Institut für Meereskunde, Veröffentlichungen, Nos. 1, 2 and 5, 1902. figs., tables, fold. charts. Also published separately. Berlin, (K.) Hofbuchhandlung, E. S. Mittler & Sohn, 1902-1903. 3 v. in 2. DLC—First report is an account of the scientific (topography, geology, oceanography, bacteriology, biology and geomagnetism) observations on the cruise of the "Gauss" from Kiel, Germany, to Cape Town to Kerguelen Island (ca. 50°S, 70°E) in the Indian Ocean. Included also (Pt. 2) are tables and charts of meteorological data (pressure, sea and air temperatures, wind, cloudiness) from the northeast and southeast Atlantic, Aug.-Oct. 1901. *Subject Headings:* 1. Deutsche Süd-Polar Expedition, 1901-1902 2. Expeditionary climatic data 3. Marine meteorological data 4. East Atlantic. I. Drygalski, Eric von.

5A-64

551.46:91.04

551.506.5(269)

*Scottish National Antarctic Expedition, 1902-1904, Report on the Scientific Results of the Voyage of S.Y. "Scotia" during the years 1902, 1903 and 1904, under the leadership of William S. Bruce. Edinburgh, The Scottish Oceanographical Laboratory, 1907-1920. 8 v. figs., tables, plates. DLC—Vol. II, Physics, Pt. I, Meteorology by R. C. MOSSMAN contains extensive tabulated pressure, temperature, humidity, wind, cloud, sea surface temperature and precipitation data collected between Nov. 1902 and July 1904 on board the Scottish vessel "Scotia" in the South Atlantic and Antarctic Oceans, at Laurie Island, South Orkneys, at Cape Pembroke, Falkland Islands and in the Weddell Sea. Pts. II and III of same volume devoted to magnetism and tides. *Subject Headings:* 1. Scottish National Antarctic Expedition, 1902-1904 2. Antarctic expeditions 3. Expeditionary climatic data 4. South Atlantic 5. Antarctic Ocean. I. Mossman, Robert Cockburn.

5A-65

551.506.5(99)

*Charcot, Jean B. A. E., Deuxième Expédition Antarctique Française (1908-1910), commandée par le dr. Jean Charcot. Sciences Physiques: Documents Scientifiques. Paris, Masson et Cie, 1911-1921. 28 v. figs., tables, charts. DLC—One lengthy volume (1911) "Observations météorologiques" by J. ROUCH is devoted to discussion and tabulation of the extensive meteorological data compiled on the cruise of the French vessel "Pourquoi-Pas" on a circular route from Cape Horn to the Shetland Islands, west along the coast of the South American Antarctic to about 120°W,

70°S, then northeastward to southern Chile. *Subject Headings:* 1. **Expédition Antarctique Française, 2nd, 1908-1910** 2. **Antarctic expeditions** 3. **Expeditionary climatic data** 4. **Antarctic Ocean.** I. Rouch, J.

5A-66

551.46:91.04

*§Bergen, Norway. Museum, **Report on the scientific results of the "Michael Sars" North Atlantic deep-sea expedition 1910.** 4 v. Bergen, John Grieg, 1930-1932. figs., tables, refs. **DLC**—Vols. II-IV are devoted to marine biology. Vol. I, however, contains the tables, charts and cross section based on the meteorological and oceanographical data compiled during the expedition. The text goes far beyond a mere descriptive discussion of the observations, treating such subjects as energy exchange between sea and atmosphere and the dynamics of the sea. *Subject Headings:* 1. **"Michael Sars" North Atlantic Deep-sea Expedition, 1910** 2. **Expeditionary climatic data** 3. **Oceanographic data** 4. **North Atlantic.** I. Murray, Sir John II. Hjort, Johan III. Helland-Hansen, Björn.

5A-67

551.506.5(99) 551.506.7(99)

*§Australasian Antarctic Expedition, 1911-1914, **Scientific Reports, Series A, B and C.** Sydney, Australia, Govt. Printer, 1918-1937. 22 v. figs., tables, charts, plates. **DLC**—Series A comprises reports on geography, oceanography and geology. Ser. C is devoted to zoology and botany and Ser. B, vols. I and II, to terrestrial magnetism. Vols. III to VII of Ser. B contain a wealth of tabulated meteorological data for Macquarie Island, Cape Denison Station, Adélie Land, Queen Mary Land, Antarctic Ocean (log of S.Y. "Aurora"), a discussion of all these observations and a series of daily weather charts, Feb. 1912-Jan. 1913, extending from Australasia and New Zealand to the Antarctic Continent. Monthly barograms and weekly thermograms for selected stations also included. Also: Australian National Antarctic Research Expeditions, 1947-1949, **A.N.A.R.E. Reports, Series D**, volumes 1-4 published 1950-1953. **DWB**—Devoted to the meteorology of Heard and Macquarie Islands. Vol. 1 (*see items* 3.5-52, May 1952 and 4.6-36, June 1953, *MAB*) includes a discussion of results of observations (1948), a description of meteorological stations on both islands, a review of modern methods of synoptic analysis for the Southern Ocean and analyzed weather charts. Volumes 2-4 contain tables of detailed surface and upper air observations. The data, available on request for reproduction or analysis, are filed on punched cards at the Meteorological Branch, Dept. of the Interior, Melbourne, Australia. Publication of a discussion of the meteorology of the sub Antarctic region is planned as soon as five years of observations have been collected and analyzed. *Subject Headings:* 1. **Australian National Antarctic Research Expeditions, 1947-1949** 2. **Australasian Antarctic Expedition, 1911-1914** 3. **Expeditionary climatic data** 4. **Upper air observations** 5. **Heard Island, South Indian Ocean** 6. **Macquarie Island, South Pacific Ocean** 7. **Antarctica.** I. Australia, Dept. of External Affairs. Antarctic Div.—G.T.

5A-68

551.506.5(268)

Maud Expedition, 1918-1925, **Scientific results of the Norwegian North Polar Expedition with the "Maud," 1918-1925.** Bergen, Geofysisk Institutt, 1927-1933. 5 v. figs., tables, plates, refs. **DLC, DWB**—Extensive wind, humidity, sea and air temperature, air pressure and cloudiness data (Vol. 3, 1930, Meteorology, Pt. II, by H. U. SVERDRUP, *see* 4E-41, May 1953, *MAB*) recorded by the staff of the "Maud" en route to and from the Polar ice pack, while imprisoned by the pack for several winters and during sledging expeditions on the pack. *Subject Headings:* 1. **"Maud" Expedition, 1918-1925** 2. **Expeditionary climatic data** 3. **Arctic expeditions** 4. **Arctic Ocean.** I. Sverdrup, H. U.

5A-69

551.46:91.04

*Schmidt, Johannes, **The Danish "Dana" expeditions 1920-22 in the North Atlantic and the Gulf of Panama.** Oceanographic Reports, No. 1-8, edited by the "Dana" Committee. London, Wheldon & Wesley, 1926-1931. figs., tables, plates. **DLC**—Expedition reports consist of eight beautifully illustrated but chiefly marine biological monographs by separate authors. Of particular meteorological interest is No. 1 (pub. 1929) by JOHANNES SCHMIDT entitled "Introduction to the oceanographical reports" and containing extensive tabulated data for weather, wind, state, temperature and salinity of the sea and depth in some cases for 565 stations in the North Atlantic and hydrographic data for 287 stations. *Subject Headings:* 1. **"Dana" Expeditions, 1920-1922** 2. **Oceanographic expeditions** 3. **North Atlantic.**

5A-70

551.46:91.04(261/4)

*Deutsche Atlantische Expedition auf dem Forschungs- und Vermessungsschiff "Meteor," 1925-1927, **Wissenschaftliche Ergebnisse.** 16 v. Berlin and Leipzig, 1932-1939. figs., tables, charts. **DLC, MWB**—Results represent the most comprehensive oceanographic survey yet attempted of the South Atlantic and include a descriptive account of the expedition (v. 1); soundings,

morphological profiles and geology (v. 2-3); oceanography, currents, waves, evaporation, temperature-salinity measurements (v. 4-7); chemistry of the sea (v. 8-9); marine biology (v. 10-13); and meteorological (v. 14) and aerological observations (v. 15-16). *Subject Headings:* 1. "Meteor" Expedition, 1925-1927 2. Expeditionary climatic data 3. South Atlantic. I. Defant, Albert (ed.).

5A-71

551.46:91.04:016

†Thorade, Hermann, *Vorläufige Ergebnisse der Deutschen Atlantischen Expedition auf Meteor.* [Preliminary results of the Deutsche Atlantische Expedition on the "Meteor."] *Petersmanns Geographische Mitteilungen*, 75:65-69, 1929. 70 refs. DWB—Author lists and discusses briefly 70 interim studies and reports on various phases of the "Meteor" expedition work. *Subject Headings:* 1. "Meteor" Expedition, 1925-1927 2. Bibliographies.

5A-72

551.506.5(99)

*Discovery Reports. Vol. 1, 1929. Latest issue, Vol. 26, 1953. Vol. 1-25 issued by the Discovery Committee of Great Britain. Vol. 26 (latest rec'd) by National Institute of Oceanography. 26 v. figs., plates, tables, fold. charts. DLC—Meteorological (pressure, temperature, wind and waves) hydrological and biological data for 299 RSS "Discovery," 1107 RSS "William Scoresby" and 2072 RSS "Discovery II" stations, 1925-1950 in the Atlantic and Indian Oceans but principally in the Antarctic Ocean are tabulated in the "Station Lists" in Vols. 1, 2, 3, 4, 21, 22, 25, and 26. *Subject Headings:* 1. "Discovery II" Expeditions, 1925-1950 2. Expeditionary climatic data 3. Antarctic Ocean.

5A-73

551.506.5(261/4)(269)

*Norske Videnskaps-Akademi i Oslo, *Scientific Results of the Norwegian Antarctic Expeditions 1927-1928 et Seq.* instituted and financed by Consul Lars Christensen. Oslo, 1929-1951. 3 v. figs., tables, refs., fold. charts. MWB—The three volumes consist of a series of 32 monographs by individual authors based on the observations made by the Norwegian ships "Odd I," "Norvegia," "Torlyn," "Thorshavn" and "Whale" in circumnavigating Antarctica or traversing the Atlantic from 60°S-60°N, 1927-1935. Subject matter is largely marine biological, geological and zoological with the exception of Vol. 1, No. 10 and 11 by HÅKON MOSBY on "The sea surface and the air" and "The waters of the Atlantic Antarctic Ocean" which contain extensive tabulated meteorological and oceanographical data respectively for the 60°N to 60°S Atlantic passages of the "Norvegia" and "Whale" 1927-28. *Subject Headings:* 1. Norwegian Antarctic Expeditions 1927-1928 2. Expeditionary climatic data 3. Oceanographic data 4. Atlantic Ocean 5. Antarctic Ocean. I. Holtedahl, Olaf (ed.) II. Mosby, Håkon.

5A-74

551.506.5(26)

*Carnegie Institution of Washington. Dept. of Terrestrial Magnetism, *Scientific results of the Cruise VII of the Carnegie during 1928-1929 under command of Captain J. P. Ault.* *Carnegie Institution of Washington, Publications* No. 536, 537, 542, 544, 545, 547, 555, 556, 562, 565, 568, 571, 1942-1946. figs., tables, charts. DLC—On the seventh and last cruise of the Carnegie (1928-29, 45,000 nautical miles), in addition to the work in geomagnetism and electricity, an extensive program of oceanographic research was included (sonic soundings, temperature and salinity observations, bottom samples, chemical investigations). Plankton in upper 100m were investigated and atmospheric circulation and evaporation over the ocean were studied and upper air soundings made. Results are published in monograph form under individual authorship as Publications of the Carnegie Institution. Meteorological volumes (No. 544, 1943, by W. C. JACOBS and K. B. CLARKE; No. 547, 1943, by ANDREW THOMSON) contain extensive tabulated data for the Atlantic and Pacific Oceans for 169 pilot balloon flights not exceeding 10.5 km in height. *Subject Headings:* 1. Carnegie Expedition, VII, 1928-1929 2. Expeditionary climatic data 3. Atlantic Ocean 4. Pacific Ocean. I. Jacobs, W. C. II. Clarke, K. B. III. Thomson, Andrew.

5A-75

551.46:91.04 551.506.5(92)

*Snellius-Expedition, 1929-1930, *The Snellius-Expedition in the eastern part of the Netherlands East-Indies 1929-1930, under the leadership of P. M. van Riel.* *Scientific Results.* Leiden, E. J. Brill, 1933-1950. 6 v. figs., tables, plates, photos, charts, refs. DLC—In 16 months (33,000 miles) of cruising in the waters of the East Indian Archipelago lying to the eastward of Java and Borneo, observations were made to determine bottom character and configuration, water exchange between the deep basins and the oceans and the chemical and physical characteristics of the water. Biological and geological observations also made. Meteorological data tabulated by element observed are found in vol. III "Meteorological Observations." by S. W. VISSER. *Subject Headings:* 1. Snellius Expedition, 1929-1930 2. Expeditionary climatic data 3. Netherlands East Indies 4. Oceanographic data. I. van Riel, P. M. II. Visser, Simon Willem.

5A-76

551.46:91.04

*Sverdrup, Harald Ulrik and Soule, F. M., Scientific results of the "Nautilus" expedition, 1931. Pt. I. Introduction and narrative; Pt. II. Oceanography; Pt. III. Echo sounding. *Papers in Physical Oceanography and Meteorology*, Cambridge, 2(1), 1933. 76 p. 46 figs., tables, refs., eqs. DWB—Because of mechanical difficulties which prevented the submarine Nautilus from submerging and crossing the Arctic under the ice, the expedition did not reach its goal and the scientific results are smaller than hoped for. They do include, however, detailed oceanographic, chemical and magnetic observations and echo soundings to 82°N. *Subject Headings*: 1. Nautilus Expedition, 1931 2. Submarines 3. Arctic exploration 4. Arctic Ocean.

5A-77

551.46:91.04

*British Museum (Natural History), The John Murray Expedition, 1933-1934, scientific reports. Vol. 1, 1935-36—Vol. 9, No. 5, 1953 (latest rec'd.). figs., tables, fold. charts. MWB—Vol. I is devoted to introductory comments and topography. Folding chart shows the 1933-34 voyage of the "Mabahiss" in the Red Sea, Gulf of Aden and Indian Ocean. Vol. II, Meteorological, chemical and physical investigations, contains Oct. 1933-May 1934 monthly charts of mean sea temperature. The balance of the volumes are concerned with zoology. *Subject Headings*: 1. John Murray Expedition, 1933-1934 2. Indian Ocean 3. Red Sea 4. Gulf of Aden.

5A-78

551.582(268):551.506.5

§*Ekspeditsiia SSSR na Severnyi Polius, 1937, Trudy dreifuishchei stantsii "Severnyi Polius"; nauchnye otchety i rezul'taty nabliudeniĭ dreifuishchei Ekspeditsii Glavsevmorputi 1937-1938 gg. [Transactions of the drifting station "Severnyi Polius". Scientific account and results of observations on the drifting expedition of the Glavsevmorputi in 1937-1938.] 2 v. Leningrad, Izdat. Glavsevmorputi, 1940-1945. DLC—Vol. I, contains a descriptive account of expedition, map of route and a complete list of coordinates of drift. Vol. II contains descriptions and discussion of meteorological apparatus and observations, p. 5-30; meteorological service of the expedition, p. 31-63; atmospheric circulation in the central polar basin, p. 64-177; tables of hourly or synoptic observations and various types of summaries, p. 187-397; cloud photographs, p. 401-423; and 58 synoptic charts on color backgrounds, p. 427-484, mostly Northern Hemisphere analyzed charts for 1937 and 1938. (For fuller abstract see item 1-127, Jan. 1950, MAB.) *Subject Headings*: 1. Arctic exploration 2. "Severnyi Polius" Expedition, 1937-1938. I. Fedorov, Evgenii Konstantinovich (ed.).

5A-79

551.506.5(98)

Badigin, Konstantin Sergeevich, Na Korable "Georgii Sedov" cherez Ledovityĭ Okean. [On the "Georgii Sedov" through the Arctic Ocean.] Moscow, Izdat. Glavsevmorputi, 1940. 606 p. figs., illus., maps (fold.). DLC—First 545 pages of this book give a popular description of the drifting expedition (Oct. 1937-Jan. 1940) with scattered scientific information. The preliminary scientific results are summarized by ZUBOV and BADIGIN on the last 60 pages, giving hydrographic data (depths, temperature sections) as well as meteorological data for temperature, pressure (with maps of seasonal and annual distribution for 1937-39) precipitation (annual total 74 mm), severity of weather, auroras, ice thickness, wind direction and speeds, ice-drift (mean angle of deviation from wind direction was 24°) and steady currents. Detailed discussion devoted to the relation between the ice-drift and the mean monthly isobars. (For further information, see abstract No. 903, *Arctic Bibliography*, 1953.) *Subject Headings*: 1. "Sedov" Drifting Expedition, 1937-1940 2. Arctic expeditions 3. Ice drift 4. Arctic Ocean. I. Zubov, N. N.—A.A.

5A-80

551.506.5(263) 551.501.7

*Vuorela, Lauri A., Contribution to the aerology of the tropical Atlantic. *Journal of Meteorology*, 5(3):115-117, June 1948. 4 figs., 6 refs. Also: Some results from the Finnish Atlantic Expedition 1939. *Helsinki, Universitet. Meteorologiska Institutet, Mitteilungen*, No. 72, 1953. 20 p. 7 figs., 7 tables, 16 refs. *Suomalainen Tiedeakatemia, Helsinki, Toimituksia*, Ser. A, I, No. 155, 1953. And: Synoptic aspects of tropical regions of the Atlantic Ocean, West Africa and South America. *Ibid.*, Ser. A, I, No. 79, 1950. Unchecked. DLC, DWB—First article presents two detailed vertical meridional sections (based on 110 radiosonde ascents, average height 21 km) between northwestern Europe and Buenos Aires for Aug.-Sept. and Oct.-Nov. showing tropopause, trade wind inversion, zonal wind components in m/sec and isotherms in °C. No data included. Second reference is a report concerning the trade wind inversion and the distribution of humidity and cloudiness over the Atlantic. Vertical meridional sections show relative humidity and mixing ratio (g/kg) for the outbound and homeward voyages. *Subject Headings*: 1. Finnish Atlantic Expedition, 1939 2. Synoptic aerology 3. Radiosonde observations 4. Trade wind inversion 5. Atlantic Ocean.

5A-81

551.506.7(269)

*U. S. Office of Naval Operations, *Aerological observations and summaries for the Antarctic, from Dec. 15, 1946 to March 15, 1947*. A project of Operations Highjump, Task Force 68. U. S. Office of Naval Operations, NAVAER 50-1R-214, Jan. 1948. 404 p. almost entirely tables. **DWB**
A summary of meteorological data in extenso obtained during one of the greatest undertakings in the history of marine weather research and made available to the scientific world quickly after the termination of the expedition, "Operations Highjump." Observations from ships were made all around the Antarctic continent and at Little America (79°S, 164°W). Most of the report is devoted to complete hourly surface observations, including also swell, state of the sea, ceiling height, etc. Upper air wind observations were made twice daily by pibals and sometimes with rawins. Numerous radiosonde data give pressure height, temperature and humidity up to 60 mb. Means for the whole duration of the expedition are computed for 20 ocean areas located mainly between 60 and 65°S to the north of the ice pack in the vicinity of the Antarctic front and separately for Little America. *Subject Headings:* 1. Marine meteorological observations 2. Upper air data 3. Antarctic Ocean 4. Little America 5. Operations Highjump. I. U. S. Navy. Task Force 68.—A.A.

5A-82

551.46:91.04

Pettersson, Hans, *Med Albatross över havsdjupen*. [With the Albatross on the deep sea.] Stockholm, Albert Bonniers Förlag, 1950. 239 p. 133 figs. **DLC**—Beautifully illustrated commentary on the Swedish Deep Sea Expedition, 1947-48. No scientific results included. *Subject Headings:* 1. "Albatross" Expedition, 1947-48 2. Oceanographic expeditions.

5A-83

551.506.5:91.04(99)

Robin, G. de Q., *Norwegian-British-Swedish Antarctic expedition, 1949-52*. *Polar Record*, (45):608-616, Jan. 1953. 2 figs., 3 photos. Also: Reece, Alan, *The base of the Norwegian-British-Swedish Antarctic Expedition, 1949-52*. *Ibid.*, p. 617-630. 4 figs., 3 photos, table. **DLC**—ROBIN describes general course of expedition, setting up of bases, journeys and flight routes and summarizes scientific results. REECE in the first of a series of articles describes equipment in base at Maudheim (1°6'S, 10°58'W). An Appendix gives monthly winds and temperatures 1950-51. (Same item as 10-40, Oct. 1953, *MAB*. For abstract of a survey of the second year's work of the expedition, see item 4.10-39, Oct. 1953, *MAB*.) *Subject Headings:* 1. Antarctic expeditions 2. Maudheim Expedition, 1949-52 3. Antarctica. I. Reece, Alan.—C.E.P.B.

5A-84

551.46:91.04

Mielche, Hakon, *Galathea laegger ud. Rejsen rundt om Afrika*. [Galathea sets out. Voyage around Africa.] Copenhagen, Steen Hasselbalsha Forlag, 1951. 224 p. photos. Also: *Galathea Østen*. [Galathea in the East.] 1952. 190 p. photos. And: *Galathea vender hjem*. [Galathea returns home.] 1953. 190 p. photos. **DLC**—A series of three popular, illustrated books descriptive of the Galathea's 1950-52 cruise from Copenhagen southward around Africa, across the Indian, Pacific and Atlantic Oceans and home to Denmark. No scientific results included. *Subject Headings:* 1. "Galathea" Expedition, 1950-52 2. Oceanographic expeditions.

5A-85

551.46:91.04(268)

*Worthington, L. V., *Oceanographic results of project Skijump I and Skijump II in the Polar Sea, 1951-1952*. *American Geophysical Union, Transactions*, 34(4):543-551, Aug. 1953. 4 figs., tables, 5 refs. **DLC**—Hydrographic data (temperature and salinity) are given for 8 stations in the "mare incognitum," the Arctic Ocean north of America. According to an added map, only for the eastern part of the Soviet sector is oceanographic information still lacking. A large anticyclonic eddy was discovered as the probable oceanic circulation north of Alaska, suggesting the existence of a submarine ridge across the Arctic basin. The observations were made from ice floes with the aid of naval planes. *Subject Headings:* 1. Oceanic circulation 2. Oceanographic data 3. Project Skijump 4. Arctic exploration.—A.A.

CHARTS AND TABULATED DATA

(Arranged chronologically by countries)

DENMARK

5A-86

551.506.1:551.46(268)(489)

*Denmark. Meteorologisk Institut, *Nautisk-Meteorologisk Årbog*. *Nautical-Meteorological Annual*. v. 1, 1897. Last issue received, 1952 (pub. 1953). Almost entirely tables. In English and Danish. Also: *Nautisk-Meteorologisk Årbog, II Del*. *Meteorologiski Observationer*. *Nautical-Meteorological Annual, Part II. Meteorological Observations*. v. 1, 1932. Last issue

received, 1937 (pub. 1952). Almost entirely tables. In English and Danish. DWB—Previous: 1897, the hydrographical and meteorological observations of lightships were published as Pt. 3 of the *Meteorologiske Årbog*. From 1897–1931, the *Nautisk-Meteorologisk Årbog* included these data, a beginning again in 1942(?) these data appear in the *Nautisk-Meteorologisk Årbog*. From 1932–1941 the *Naut. Met. Årbog* lacked these data, so data for those years will appear as Pt. 2 of the corresponding *Nautisk-Meteorologisk Årbog* for that year. In present form, the *Årbog* for each year contains tabulated wind, cloudiness, weather, air and sea temperature, visibility, current, state of the sea and salinity data for 12 light ship stations in the North Sea, Skagerrak, Kattegat and Baltic Sea and for 19 Danish coastal stations. (*Same item as 3.10–44, Oct. 1952 MAB.*) *Subject Headings:*

1. Marine meteorological data 2. Yearbooks 3. Denmark.

5A-87

551.311.1

Denmark. Meteorologisk Institut, *Isforholdene i de Arktiske have. 1900–1939; 1946–1950*. State of ice in the Arctic seas. Denmark. Meteorologisk Institut, *Nautisk-Meteorologisk Årbog. Tillæg [Appendix], 1900–1950* (latest rec'd.). charts. In English. DWB—"Reports on the state of the ice in the Arctic seas were published by the Danish Meteorological Institute for each of the years 1901–1939 and 1946–1950. For the intervening years, 1940–1945, the Institute is endeavoring to collect data which will make possible a later publication of reports from these years." Non-Atlantic sea surface temperature charts were included through the 1939 (?) issue. Annual reports (currently prepared by HELGE THOMSEN, Chief of the Nautical Section) consist of discussion of the annual and seasonal ice characteristics and of monthly details by regions plus color charts showing ice types and extent for that particular year as contrasted with average conditions for 1898–1920. When publication resumed in 1946 data from the Soviet and partly the American Arctic were longer available. *Subject Headings:* 1. Sea ice 2. Arctic Ocean 3. North Atlantic. I. Thomsen Helge.

FRANCE

5A-88

551.582.3(2)

*France. Bureau Central Météorologique, *Atlas de météorologie maritime publié à l'occasion de l'exposition maritime internationale du Havre*. [Atlas of marine meteorology published on the occasion of the International Maritime Exposition at Le Havre.] Paris, Gauthier-Villars, 1938. 35 p. 7 figs., tables, 33 plates. DWB—Introductory notes by LEON TEISSERENC DE BORT precede ocean charts showing pressure, wind, storms, currents, temperature and magnetic declination. *Subject Heading:* 1. Marine atlases. I. Teisserenc de Bort, Léon.

GERMANY

5A-89

551.582.3(2)

Wilhelmshaven, Germany. Marineobservatorium, Klimadienst, *Stiller Ozean Klimakarte* [Pacific Ocean climatic charts.] 1940. Also: *Atlantischer Ozean Klimakarte*. [Atlantic Ocean climatic charts.] 1940. And: *Indischer Ozean Klimakarte*. [Indian Ocean climatic charts.] 1940. charts and tables. MWB—*Subject Heading:* 1. Marine climatic charts.

5A-90

551.582.3(26)

Hamburg. Deutsche Seewarte, *Monatskarten für den Nordatlantischen Ozean, neubearbeitet von der Deutschen Seewarte, 1939–1940*. [Monthly charts for the North Atlantic, revised by Deutsche Seewarte.] Hamburg, Oberkommando der Kriegsmarine, 1940. 48 p. Also: *Monatskarten für den Südatlantischen Ozean*. [Monthly charts for the South Atlantic.] Hamburg, 1944. 52 p. DWB—Monthly charts for the Atlantic, 60°N–6°S and 10°N–5°S compiled by the Deutsche Seewarte from British, Dutch and German ship reports with variable but substantial periods of record for different elements. Recorded on charts are wind roses for 5° squares, limits of drifting ice, limits of sand and dust, fog frequencies, ocean currents, sea surface temperature, salinity and density, air pressure and prevailing wind direction, wind speed, storm frequencies (Beaufort force ≥ 8), air temperature, precipitation and frozen precipitation frequencies. Selected synoptic situations shown. *Subject Headings:* 1. Marine meteorological charts 2. North Atlantic South Atlantic,—R. Quiroz.

5A-91

551.582.3(26)

Germany. Meteorologisches Amt für Nordwestdeutschland, *Klimatologie des östlichen Teils des Mittelatlantischen Ozeans nach Schiffsbeobachtungen. Seeraum: 40°N bis Äquator, 30°W bis zur iberischen und afrikanischen Küste*. [Climatology of the eastern part of the mid-Atlantic from ship's observations. Ocean area: 40°N to equator, 30°W to the Iberian and African coasts.] Hamburg, 1947. 47 p. 14 tables, numerous charts. DWB—Monthly charts show mean wind pressure, cloudiness, air and sea temperature and weather based on approximately 500,000 punched

rd recorded ships' observations from the years 1912-14, 1918-21 and particularly 1922-39. Mean monthly data tabulated by element observed in approximately 4° square subdivisions of the African coastal waters and East Atlantic. *Subject Headings: 1. Marine climatic charts 2. East Atlantic. Kuhlbrodt, Erich (ed.).*

5A-92

551.311.1(26)

Hamburg. Deutsches Hydrographisches Institut, *Atlas der Eisverhältnisse des Nordatlantischen Ozeans und Übersichtskarten der Eisverhältnisse des Nord- und Südpolargebietes*. [Atlas of ice conditions in the North Atlantic Ocean and general charts of the ice conditions of the North and South Polar regions.] Hamburg, 1950. 24 p. 34 col. charts, bibliog. p. 24. *Hamburg. Deutsches Hydrographisches Institut*, No. 2335. **DLC, DWB**—Monthly charts show mean (1919-1943) ice characteristics and extent in the North Atlantic, Arctic and Antarctic (1929-1939) oceans. Text devoted to a discussion of the geographical distribution of ice and to the definition of the various types of ice. *Subject Headings: 1. Sea ice 2. Marine atlases 3. North Atlantic 4. Arctic Ocean 5. Antarctic Ocean. I. Büdel, Julius (ed.).*

5A-93

551.5(02) 55.03(02) 52(02)

†Landolt, Hans H. and Börnstein, Richard, *Zahlenwerte und Funktionen aus Chemie, Astronomie, Geophysik und Technik*. [Tables and equations in physics, chemistry, astronomy, geophysics and technology.] 6th ed. Edited by Arnold Eucken. Berlin, Springer, 1950-1952. Vol. 3, *Astronomie und Geophysik*. 1952. Prepared by Georg Joos; Julius Bartels and Paul ten Brügge, eds. 795 p. tables, charts, figs., bibliogs. **DWB, DLC**—Section 326 on Oceanography (v. 3, p. 426-541) by G. DIETRICH and J. JOSEPH gives hundreds of tables and references on physical and chemical constants of the oceans, sea ice, effect of atmospheric pressure, optics, surface temperature (diurnal and secular variation), salinity, and dynamic oceanography (currents, waves, Austausch, tides, ice conditions). Section 327 (p. 542-563) by FRIEDRICH takes up hydrography of flowing water, lakes, ground water, etc. including evaporation, effect of precipitation, hydrologic cycle, etc. (*Same item as 4.4-9, April 1953, MAB.*) *Subject Headings: 1. Geophysical tables 2. Oceanographic data. I. Eucken, Arnold (ed.) II. Dietrich, G. III. Joseph, J. IV. Friedrich, H. (ed.).*

5A-94

551.577.21 551.577.32

*Möller, Fritz, *Vierteljahreskarten des Niederschlags für die ganze Erde*. [Quarterly charts of rainfall for the whole earth.] *Petermanns Geographische Mitteilungen*, 95(1):1-7, 1951. 2 figs., 1 old. chart, 3 tables, 43 refs. **DLC**—The chief difficulty in constructing these charts was the precipitation over the oceans. After discussing correction by estimates of evaporation and use of island and coast stations, SCHOTT is followed for Atlantic and for the remainder MEINARDUS' charts (1934) are decreased by $\frac{1}{2}$. The large scale seasonal equal area charts are discussed and the mean precipitation for each season is calculated by 5° zones of latitude for land (after BROOKS and HUNT), sea and total. Two types of annual variation, Atlantic and West Pacific, are found over the oceans. (*Same item as 3.4-200, April 1952, MAB.*) *Subject Headings: 1. Precipitation amount 2. Precipitation variations 3. Global precipitation 4. Precipitation at sea.—C.E.P.B.*

GREAT BRITAIN

5A-95

551.582.2(26)

*Great Britain. Meteorological Office, Réseau Mondial. *Monthly and annual summaries of pressure, temperatures, and precipitation at land stations, generally two for each ten-degree square of latitude and longitude [1910-1932]*. London, H.M. Stationery Office, 1917-1940. 23 vols. Old. charts, tables. Title varies. **DWB**—One of the most comprehensive sources of data from which anomalies of temperature and pressure all over the world can be plotted. Publication of data commenced in 1917, with the annual volume for 1911. The volume for 1921 was the first to include data from the oceans (for 5° squares, mostly in the Atlantic Ocean). Published under the auspices of the International Meteorological Committee. (*Same item as 3C-13, March 1952, MAB.*) *Subject Headings: 1. Climatic data 2. Marine climatic data 3. World climate.*

5A-96

551.582.3

Great Britain. Meteorological Office, *Meteorological charts for the world*. London, H.M. Stationery Office, Dec. 31, 1928. Charts Nos. 2917-18; 2930-34. All charts. **DWB**—Quarterly charts of 60°S-70°N show mean directions and velocities of stream and drift currents as well as winds, isotherms and isobars for the Pacific, Atlantic and Indian Oceans. Charts were compiled from Great Britain Meteorological Office and Hydrographic Office and U. S. Hydrographic Office charts. (*Same item as 4I-55, Sept. 1953, MAB.*) *Subject Headings: 1. World meteorological charts 2. Marine meteorological charts 3. Oceans.*

5A-97

551.582.3(26)

Great Britain, Meteorological Office, **Monthly meteorological charts of the Atlantic Ocean**. London, H.M. Stationery Office, 1948. 122 p. charts. M.O. 483. Also: ——— of the **Western Pacific**. 1947. 122 p. charts. M.O. 484. ——— of the **Eastern Pacific Ocean**. 1950. 122 p. charts. M.O. 518. And: ——— of the **Indian Ocean**. 1949. 98 p. charts. M.O. 519. **DWB**—Four large atlases, which deal comprehensively with the climatology of the oceans, month by month. Prepared during war primarily for operational purposes. All data shown on charts of the oceans by isopleths except wind and swell data which, being vector quantities, do not lend themselves to such representation. Observations generally grouped in 5° squares. Monthly mean, maximum and minimum sea and air temperatures and range between maximum and mean plotted as well as isotherms of the mean monthly differences between sea and air temperatures. Cloud data represented by four charts for each month. Other weather factors represented include fog, mist, haze, lightning, and precipitation. Wind roses constructed for each 5° square. "Swell" roses showing direction and intensity, typical monthly cyclonic storm tracks and correction and conversion tables also included. *Subject Headings*: 1. Marine climatic charts 2. Marine atlases 3. Oceans.

5A-98

551.582.3(26):016

†Great Britain. Hydrographic Office, **Catalogue of Admiralty charts and other Hydrographic publications**, 1953. Complete edition . . . corrected to 30th April 1953. 79 p. Its: *Hydrographic Publication*, H.D. 374. 1952. Price: 5s.Od. **DWB**—An enormous number of pilot and other charts published by the British Admiralty are listed according to specific parts of the earth, and according to index number, showing their location on survey maps. Contains also index of a few recent meteorological and ice charts, oceanographical diagrams, sailing directions, radio stations and tidal publications. *Subject Headings*: 1. Marine pilot charts 2. Sailing directions 3. Bibliographies.—A.A.

JAPAN

5A-99

551.582.3(265/6)

Japan. Hydrographic Dept., **Military weather charts, Indian Ocean**. Tokyo, May 1943. Also: **Military weather charts, northern North Pacific Ocean**. Dec. 1943. **North Pacific weather charts**. Sept. 1939. **Military weather charts, Aleutians, Hawaii, west coast of United States**. July 1944. **Military weather charts, South China Sea and surrounding areas**. Aug. 1944. **Military weather charts, vicinity of Coral Sea**. Feb. 1943. Entirely in Japanese. **MWB**—*Subject Headings*: 1. Marine climatic charts 2. Pacific Ocean 3. China Sea.

NETHERLANDS

5A-100

551.506(26)

*Netherlands. Meteorologisch Instituut, **Oceanographische en meteorologische Waarnemingen in den Atlantischen Oceaan**. [Oceanographic and meteorological observations in the Atlantic Ocean.] *Netherlands*. (K.) *Meteorologisch Instituut*, No. 110, 1856-1925. Also: **Monthly meteorological data for ten-degree squares in the Atlantic and Indian Oceans**. And: . . . in the Oceans. *Ibid.*, No. 107, 107A, 107B, Jan. 1900-Dec. 1930. And: **Oceanographische en meteorologische Waarnemingen in den Indischen Oceaan**. [Oceanographic and meteorological observations in the Indian Ocean.] *Ibid.*, No. 104, 1924-1930. **DN-HO**—Wind, pressure, temperature, cloudiness and hydro-meteor data (1856-) for 10° squares in the Atlantic, Pacific and Indian Oceans. *Subject Headings*: 1. Marine climatic charts 2. Oceans.

NORWAY

5A-101

551.582.3(26):551.311.1

Maurostad, Alf, **Atlas of sea ice**. *Geofysiske Publikasjoner*, Oslo, 10(11), 1935. 17 p. 10 plates, 2 refs. **DLC**—Textual discussion of development of sea-ice, ice terminology, glacier ice in the sea and the freezing, melting and physical properties of ice in the sea precedes forty photographs illustrating the various types of marine ice. *Subject Headings*: 1. Sea ice 2. Atlases.

U.S.S.R.

5A-102

551.311.181(268)(266.5)

*U.S.S.R. *Gidrograficheskoe Upravlenie*, **Svedeniia o sostoianii l'dov na moriakh SSSR**. [The state of the ice in the seas of the U.S.S.R.] Vol. 1-8, 1924/25-1931/32 (publ. 1926-1936). illus., tables, charts. Title-page, tables of contents and captions to tables in Russian and English; text in Russian. **DLC**—Contains list of stations arranged by seas with name of observer. Tables of freezing and of the breaking up of sea waters include dates of first ice, first land ice, interruption

navigation, and final clearing of ice, number of days of ice, greatest noted extent of land ice and greatest thickness of ice. Short description of the state of the ice given for the major embayments of the Barents, White, Kara, Bering, Okhotsk and East Siberian Seas. (Abstract No. 18215, *Arctic Institute of North America, Arctic Bibliography*, Vol. 2:2694, 1953.) *Subject Headings: 1. Sea ice Soviet Arctic.—From Arctic Bibliography.*

5A-103

551.582.3(26,47)

Isakov, I. S., *Pervyi tom morskogo atlasa*. [The first volume of the marine atlas.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr.*, No. 1:72-74, 1951. DWB—Comments made on the new Soviet marine atlas which, although its main purpose is to depict ocean and sea regions, attempts to be more comprehensive through the inclusion of atmospheric and oceanic data. Names of archipelagos, islands, etc. discovered by and named for Russian explorers particularly noted. A new classification of ocean bottoms and system of relief coloration for land and ocean regions are added. Atlas itself not yet seen. (Same item as 3.9-206, Sept. 1952, *MAB*.) *Subject Headings: 1. Marine atlases 2. U.S.S.R.—A.M.P.*

UNITED STATES

5A-104

551.582.3(26)

U. S. Hydrographic Office, *Pilot charts of the North Atlantic Ocean*. Dec. 1883-Dec. 1953 (latest rec'd). Also: . . . *North Pacific Ocean*. 1894-Dec. 1953 (latest rec'd). . . . *Indian Ocean*. Dec. 1909-Dec. 1953 (latest rec'd). . . . *South Atlantic Ocean*. June 1909-Dec. 1953 (latest rec'd). . . . *South Pacific Ocean*. Sept. 1909-Dec. 1953 (latest rec'd). . . . *Central American waters*. 1915-1953 (latest rec'd). And: . . . *upper air North Atlantic Ocean*. Dec. 1927-June 1945 (no more pub'd). . . . *upper air North Pacific Ocean*. 1929-June 1945 (no more pub'd). DWB—Monthly charts constructed in Mercator's projection and containing information such as great circle routes, curves of equal magnetic variations, storm tracks, number of days with g, and wind roses for 5° squares. Barometric pressure shown on inset charts. Articles, tables and graphs of special meteorological interest appear on the backs of many of the charts. Chart No. 603, *Indian Ocean*, Oct. 1953, has on its reverse side an index of pilot chart articles, Jan. 1948-Oct. 1953 and addresses from which back issues of Pilot Charts may be obtained. *Subject Headings: 1. Marine climatic charts 2. Oceans.*

5A-105

551.509.21(01)

U. S. Weather Bureau, *Daily synoptic series, Historical weather maps, Northern Hemisphere, sea level*. Jan. 1899-June 1939. Continued as: *Daily Series, synoptic weather maps; Northern Hemisphere sea level and 500 millibar charts with synoptic data tabulations*. Jan. 1949-Feb. 1952 (latest rec'd). DWB—The older series of charts consisted of monthly volumes of daily synoptic weather maps for 1300Z for the period Jan. 1, 1899-June 30, 1939. The July 1939-Sept. 1945 charts were never and probably never will be prepared. The U. S. Air Force published the Oct. 1945-Sept. 1947 charts at which time the Weather Bureau resumed publication. The present series which was divided in Jan. 1952 into two parts, Pt. I. (Northern Hemisphere Sea Level and 500 millibar charts) devoted to maps and Pt. II (Northern Hemisphere Sea Level and Upper Air Data Tabulations) to data, is one of the best sources of data from ships at sea. *Subject Headings: 1. Synoptic charts 2. Marine meteorological charts 3. Northern Hemisphere.*

5A-106

551.506.3 551.582.2

*Clayton, Henry Helm (ed.), *World weather records*. *Smithsonian Miscellaneous Collections*, v. 79, no. 105, 1927-1947. 3 v. tables. Title varies. *Smithsonian Institution, Publications*, 2913, 3218, 3803. DWB—A long and homogeneous series of observations in the form of monthly means of pressure and temperature and totals of rainfall for selected stations generally belonging to the *Réseau Mondial* (see 5A-95 above). Numerous stations in the Atlantic, Pacific and Indian Oceans included. Vol. 79 contains from the earliest available observations to 1920, Vol. 90 covers 1921-1930 and Vol. 105, 1931-1940. *Subject Headings: 1. World climate 2. Climatic data 3. Marine climatic data.*

5A-107

551.582.3(26)

McDonald, Willard F., *Atlas of climatic charts of the oceans*. U. S. Weather Bureau, No. 1247, 1938. 130 charts. DWB—Charts derived from approximately 5½ million observations taken on ships at sea during a period of more than 50 years. Data from islands and continents not introduced in order that the material may be truly representative of conditions on the open sea. Charts include winds, visibility, cloudiness, rainfall and thunderstorms and temperature for all oceans. *Subject Headings: 1. Marine climatic charts 2. Marine atlases I. U. S. Weather Bureau.*

5A-108

551.582.3:551.526.6

†California. University. Scripps Institution of Oceanography, **World atlas of sea surface temperatures**. 1944. all charts, 41 refs. **DLC, DWB**—Believed to be the most accurate pattern of sea surface temperature of the world prepared to date (1944). Isotherms are shown for intervals of 5°F except that in regions of small horizontal temperature gradients 2.5° isotherms have been entered. Information on ice limits shown. *Subject Headings*: 1. Sea temperatures 2. Marine atlases.

5A-109

551.582.3(26):551.557.2

U. S. Hydrographic Office, **Atlas of monthly pilot charts of the upper air, North Atlantic and North Pacific Oceans**. 1945. 24 p. of col. charts. H.O. Publ. No. 560. **DLC, DWB**—Monthly charts show frequency of wind direction and velocity at surface, 2500 ft, 5000 ft and 10,000 ft for island and coastal stations and 5° ocean squares. Also recorded are pressure, air and sea temperature, fog, storms, currents, magnetic variation, and airplane and steamer routes. Inset maps show gales and monthly isobars and isotherms. *Subject Headings*: 1. Marine climatic charts 2. Upper air winds 3. Marine pilot charts 4. Atlantic Ocean 5. Pacific Ocean.

5A-110

551.582.3(261):551.557.2

U. S. Weather Bureau, **Wind frequency distribution. North Atlantic Ocean, 6 and 10 km. And: Northwest Pacific Ocean, 3, 6 and 10 km.** Wash., July 1945 and Sept. 1946. tables and charts. **DWB**—Contains Baillie wind roses representing frequencies of wind direction and wind speed for each specified level, 1942-1944 (Atlantic) and 1939-1940 (Pacific). *Subject Headings*: 1. Marine meteorological charts 2. Winds at sea 3. North Pacific 4. North Atlantic.

5A-111

551.582.3(01):551.311.1

*†U. S. Hydrographic Office, **Ice atlas of the Northern Hemisphere**. 1946. 106 p. charts, 1700 refs., tables. H.O. Pub. No. 550. **DLC**—Includes monthly Northern Hemisphere charts of ice distribution and character, ice data tables and charts by geographic regions, and 1700 references of worldwide scope to pertinent literature. *Subject Headings*: 1. Sea ice 2. Marine atlases 3. Northern Hemisphere.

5A-112

551.582.3(01)

U. S. Weather Bureau, **Normal weather maps, Northern Hemisphere. Sea level pressure. Wash., 1946.** 1 p. 13 charts. **DWB**—Contain normal monthly and annual sea level distribution of pressure as determined for the 40½ year period (1899-1939) covered by the "Daily Historical Weather Maps" (see 5A-105 above). *Subject Headings*: 1. Marine climatic charts 2. Pressure distribution 3. Northern Hemisphere.

5A-113

551.509.1(09):551.582.3

Wexler, Harry and Tepper, Morris, **Results of the wartime historical and normal map program. American Meteorological Society, Bulletin**, 28(4):175-178, April 1947. **DWB**—Discussion of the type and contents of the various classes of wartime maps prepared (from 1899-1939 data) by the Army Air Forces, U. S. Navy and Weather Bureau. Maps included are: 1) Daily historical weather maps; 2) Normal monthly weather maps; and 3) Miscellaneous maps, charts and tables. *Subject Headings*: 1. World climate 2. Climatic charts.

5A-114

551.506.1:551.582.2

*U. S. Weather Bureau, **Monthly climatic data for the world by continents**. Vol. 1, May 1948—v. 6, 1953 (latest rec'd). tables. **DLC**—Extensive tabulated surface and upper air data including observations from Air Weather Service island stations in the Pacific and ocean weather ships in the Atlantic and Pacific. Based on monthly "CLIMAT" broadcasts verified in most cases by confirmation copies sent by air mail. (Same item as 2.11-21, Nov. 1951, MAB.) *Subject Headings*: 1. Marine climatic data 2. World climate 3. Climat broadcasts.

5A-115

551.582.3(26)

U. S. Hydrographic Office, **Atlas of pilot charts of the Atlantic Ocean. And: . . . of the Pacific and Indian Oceans**. Wash., D. C., Jan. 1, 1950. All charts. H. O. Publ. Nos. 576 and 577. **DN-HO**—Bound volumes of monthly charts showing pressure, air and sea temperature, fog, storms, currents, magnetic variation, air and steamer routes and gales. *Subject Headings*: 1. Marine climatic charts 2. Marine pilot charts 3. Atlantic Ocean 4. Pacific Ocean 5. Indian Ocean.

MARINE METEOROLOGY

(Arranged chronologically)

1851

5A-116

551.5(09)(26):06

Maury, Matthew Fontaine, *On the establishment of an universal system of meteorological observations by sea and land*. Wash., D. C., C. Alexander, 1851. 30 p. DLC—A pamphlet of historical interest containing reprints of official correspondence between the United States (much of it by Maury) and Great Britain regarding the worldwide standardization of meteorological observations on land and sea and the need for an international conference of meteorologists. *Subject Headings*: 1. Maritime Conference, Brussels, 1853 2. Progress in meteorology 3. Marine meteorology.

1877

5A-117

551.5(26)

Scott, Robert H., *Remarks on the present condition of maritime meteorology*. *Royal Meteorological Society, Quarterly Journal*, 3(20):185-198, Oct. 1877. DWB—Review of early marine meteorological organization and work on the part of the Dutch, English, French, Germans and Americans after the Brussels Conference in 1853. Need for standardized marine meteorological charts stressed. *Subject Headings*: 1. Marine meteorology 2. History of meteorology.

1896

5A-118

551.588.1

Pettersson, Otto, *Über die Beziehungen zwischen hydrographischen und meteorologischen Phänomenen*. [On the relation between hydrographical and meteorological phenomena.] *Meteorologische Zeitschrift*, 13(8):285-318, Aug. 1896. 14 figs., refs. DWB—First statistical proof of the effect, particularly on winter climate in Scandinavia, of the position and heat transport of the Gulf Stream and of the periodic and non-periodic variations of the latter. More intense investigation of ocean surface layers (to 800m) urged. *Subject Headings*: 1. Marine influences 2. Climate of Scandinavia 3. North Atlantic.

1898

5A-119

551.577.2(26)

Supan, Alexander, *Die jährlichen Niederschlagsmengen auf den Meeren*. [The yearly amounts of precipitation on the oceans.] *Petermanns Geographische Mitteilungen*, 44:179-182, 1898. 2 tables, refs. DWB—From tabulated ships' observations of the number of days with rain experienced in small subdivisions of the Atlantic, Pacific and Indian Oceans, approximate rainfall amounts are derived. *Subject Headings*: 1. Rainfall distribution 2. Precipitation at sea.

5A-120

551.588.1:551.465

Pettersson, Otto, *On the probable occurrence in the Atlantic current of variations periodical, and otherwise, and their bearing on meteorological and biological phenomena, with an introduction*. *Conseil Permanent International pour l'Exploration de la Mer, Copenhagen, Rapports et Procès-Verbaux*, Vol. 3, 1905. English Edition, General Report on the work of the period July 1902-July 1904 with 10 appendixes. Append. A. 36 p. 23 figs., refs. DLC—Introductory remarks on the bathymetric features and topography of the northeastern Atlantic precede an extensive discussion of seasonal and annual variations in the water and heat transport of the Atlantic current as evidenced by invasions of warm water into the Barents Sea and the Kattegat, the retardation of the seasons in the countries surrounding the Norwegian Sea, North Sea and Baltic, and by changes in character and abundance of marine life. *Subject Headings*: 1. Marine influences 2. Heat exchange sea-atmosphere 3. Northeast Atlantic. I. Kyle, H. M. (trans.)

1910

5A-121

551.588.1:551.465

*Petersen, Johannes, *Unperiodische Temperaturschwankungen im Golfstrom und deren Beziehung zu der Luftdruckverteilung*. [Non-periodic temperature variations in the Gulf Stream and their relation to air pressure distribution.] *Annalen der Hydrographie und Maritimen Meteorologie*, 38:397-417, 1910. 8 figs., tables, refs. DWB—Detailed description of movements of the Icelandic Low back and forth between southern Greenland and the Norwegian Sea in response to the changing distribution of water temperatures induced by its own winds. Temperature data tabulated. *Subject Headings*: 1. Sea temperature variations 2. Pressure at sea 3. Icelandic Low 4. North Atlantic.

1911

5A-122

551.552(26)

Lütgens, Rudolf, *Die Grösse der hauptsächlichsten Windgebiete auf dem Meere*. [The size of the major wind regions over the oceans.] *Annalen der Hydrographie und Maritimen Meteorologie*, 39(5):265-267, 1911. 5 tables. DWB—Tabulation and comparison of the major wind areas in the Atlantic, Indian and Pacific Oceans and in high latitudes show the total of monsoon, trade and calm belts cover 46% of the world water surface (the trades alone 31%), the westerlies 24%, the transition zone 19.5% and the equatorial calms 9%. *Subject Headings*: 1. Winds at sea 2. Atmospheric circulation.

1916

5A-123

551.588.1:551.555.1

*Gallé, P. H., *On the relation between fluctuations in the strength of the trade winds of the North-Atlantic Ocean in summer and departures from the normal of the winter temperature in Europe*. (K.) *Akademie van Wetenschappen te Amsterdam. Afdeling voor de Wis- en Natuurkundige Wetenschappen, Proceedings of the Section of Sciences*, 18(9):1435-1448, 1916. figs., tables, refs., eqs. DLC—Review of earlier approaches to the same problem with references to the literature. Table II (p. 1441-1445) contains correlation factors between departures in the strength of the northeast trade over three periods (May-Oct.; June-Oct.; June-Nov.) and those of the temperatures during the following winter in Europe for 135 stations or districts, 1899/1900-1913/1914. *Subject Headings*: 1. Marine influences 2. Long range forecasting 3. Gulf Stream variations 4. Climate of Europe.

5A-124

551.526.6:551.590.21

†Helland-Hansen, Björn and Nansen, Fridtjof, *Temperaturschwankungen des nordatlantischen Ozeans und in der Atmosphäre; einleitende Studien über die Ursachen der klimatologischen Schwankungen*. [Temperature variations in the North Atlantic Ocean and in the atmosphere; introductory studies on the causes of climatological variations.] *Videnskaps-Selskabet i Kristiania, Math.-naturv. Klasse, Skrifter*, No. 9, 1916. 341 p. 48 plates, 97 figs., tables, refs. English trans. with additions by the authors and by Charles G. Abbot, in: *Smithsonian Miscellaneous Collections*, 70(4), 1920. 408 p. DLC. Abstract in: *Monthly Weather Review*, 46:177-178, April 1918. DWB—Classic paper in which the authors, through a detailed study of sea surface temperature variations using 1898-1910 Deutsche Seewarte data, find that sea-surface temperatures in the North Atlantic are closely related to the immediately preceding departures of winds from normal directions and strengths. Study also made of the periodicity of the variations of the surface temperature of the Atlantic Ocean and of the air temperature of the continents. Analysis of meteorological elements (air pressure, wind velocity, rainfall, cloudiness, temperature) on land and sea results in a composite picture of the meteorological fluctuations in which "different groups of regions vary intact in a definite direction while another group varies in an opposite sense and still others show transition phenomena." Variations in terrestrial phenomena and sunspot activity compared and partial explanation given for the former's not being directly dependent on the latter. Complicated as the relations appear, the authors feel that further investigation of meteorological data may reveal the ways in which changes in solar radiation first affect the higher layers of the atmosphere and then are transmitted to the lower layers where they affect the surface pressure distribution, winds, sea surface temperatures and, finally, weather. Extensive tabulated data included. Postscript to translation, p. 267-333 contains reviews of several papers (1914-1917) resulting from research which established beyond doubt that radiation from the sun varies periodically in a manner similar to sunspots as well as within short intervals of a few days and that correlations exist between these fluctuations in solar radiation and meteorological and magnetic changes on the earth. *Subject Headings*: 1. Sea surface temperature variations 2. Sunspot activity 3. Solar radiation 4. North Atlantic. I. Abbot, C. G.

5A-125

551.5(26)

Pettersson, Hans, *Meteorological aspects of oceanography*. *Monthly Weather Review*, 44(6): 338-341, June 1916. 2 figs., 2 refs. DWB—Brief survey of ocean effects on weather including influence of ocean on air temperatures, atmospheric circulation and rainfall. Author compares "that great regulator, the ocean," to "a kind of 'savings bank' for solar energy receiving deposits in seasons of excessive insolation and paying them back in seasons of want." *Subject Headings*: 1. Marine influences 2. Climate of Europe 3. North Atlantic.

1918

5A-126

551.526.6:551.509.33

Brooks, Charles F., *Ocean temperatures in long range forecasting*. *Monthly Weather Review*, 46(11):510-512, Nov. 1918. refs. DWB—Brief discussion of origin and movement of water

surface temperature departures, the control which ocean temperatures exert on atmospheric pressure and winds, and what weather is associated with various pressure types. Possible applications to long range forecasting in the North Pacific mentioned. *Subject Headings:* 1. Marine influences 2. Long range forecasting 3. Sea temperatures 4. North Pacific.

1925

5A-127

551.5(26)

Smith, H. T., *Marine meteorology: history and progress*. *Marine Observer*, 2:33-35, 90-92, 173-175, 1925. figs. DWB—Pt. I deals with the early history of marine meteorology from VIRGIL, 27 B. C., through the invention of the barometer to the 1853 international Brussels Conference instigated by MAURY. Pt. II on the "Middle Period" is concerned with the early program of the British Meteorological Department (founded 1854) and the introduction of periodical ocean charts. Pt. III, "Present Day" includes a sample specimen of a coded ship's log and corresponding punched card. *Subject Headings:* 1. History of meteorology 2. Marine meteorology.

1927

5A-128

551.501.83:551.515.2

Gherzi, E., *Atmospherics and typhoons at sea*. *Marine Observer*, 4(44):159-160, Aug. 1927. 2 figs. DLC—Brief article citing several interesting cases in which ships reported definite decreases in sferics with the approach of typhoons indicating that typhoon centers do not necessarily cause radio disturbances. (Same item as 4K-58, Nov. 1953, MAB.) *Subject Heading:* 1. Sferics from typhoons.

5A-129

551.588.1

Littlehales, G. W., *The ocean among the factors of the control of climate: Symposium on some factors of climatic control*. *National Research Council, of Washington, Bulletin*, No. 61:26-31, 1927. DLC—A non-technical generalized account of currents and winds. Author remarks on water transport along the Norwegian coast as it affects temperature and points out that "a tract of ocean 450 miles square and one-tenth of a mile deep, in being reduced one degree in temperature would give off enough heat to raise the temperature of the atmosphere 10° over the whole of the U. S. up to a height of 2 miles." *Subject Headings:* 1. Marine influences 2. Ocean currents.

1928

5A-130

551.555.1

Barlow, E. W., *The trade winds*. I. Historical and general. II. Atlantic, Pacific and Indian Oceans. III. Historical theories of the trade winds. IV. The general circulation. *Marine Observer*, 5(49,53,57,59):31-34, 93-100, 183-186, 228-234, Jan., May, Sept., Nov. 1928. figs., tables. DWB—A summary of knowledge to date on the trade winds containing a detailed consideration of the characteristics of the trades in the three major oceans and a short account of the general circulation as related to the trades. *Subject Headings:* 1. Trade winds 2. Atmospheric circulation.

1929

5A-131

551.511(26)

Hesselberg, T., *Die Stabilitätsbeschleunigung im Meere und in der Atmosphäre*. [The stability acceleration in the ocean and in the atmosphere.] *Annalen der Hydrographie und Maritimen Meteorologie*, 57(9):273-282, 1929. 2 tables, 19 eqs. DWB—In 1915, the author and H. U. SVERDRUP derived the expression $E = \frac{e - e'}{\Delta z}$; where E is stability, e is the density of the water at level z , and e' is the density of a water particle P that through some impulse is moved from the level $z + \Delta z$ a short distance Δz to level z (*Bergens Museums Aarbok* 1914/15, No. 15). Later HESSELBERG revised the expression to read $E' = \frac{1}{e} \frac{e - e'}{\Delta z}$ to take into account the fact that the acceleration with which the particle P attempts to move itself from its new position to its old is inversely proportional to the density of the particle (*Annalen der Hydrographie*, 46(3/4):118-129, 1918). In this article he improves the expression once again to account for the dependence of the acceleration of the particle P in its new position on the acceleration g of gravity. $E'' = \frac{g}{e} \frac{e - e'}{\Delta z}$. *Subject Headings:* 1. Stability 2. Oceans.

1930

5A-132

551.588.1

Brooks, C. E. P., *The role of the oceans in the weather of western Europe*. *Royal Meteorological Society, Quarterly Journal*, 56(234):131-140, April 1930. 2 figs. DLC—Apparent "effect

which variations in the great ocean currents of the Atlantic, and in the amount of ice in the Arctic Ocean have on seasonal weather changes in western Europe" dealt with. Way in which effects on European climate of slight temperature and ice variations are magnified through the influence they exert on the pressure pattern pointed out. *Subject Headings:* 1. Marine influences 2. Climate of Western Europe 3. Sea ice 4. Sea temperature variations 5. Western Europe.

1932

5A-133

551.581(26)

*Harries, H. D., *Über die Veränderlichkeit von Monatswerten meteorologischer und hydrologischer Elemente der Äquatorialsee*. [On the variability of monthly values for meteorological and hydrological elements of the Equatorial ocean.] *Annalen der Hydrographie und Maritimen Meteorologie*, 60(12):496-499, Dec. 1932. 3 tables. **DLC**—Monthly mean (1921-1930) wind, air pressure and temperature, cloudiness and hydrometeor data for Indian (0-10°N, 70-90°E; 0-10°S, 70-90°E) and Atlantic (15-25°N, 25-35°W; 5-15°N, 25-35°W; 0-10°S, 0-10°W) Oceans tabulated. Annual mean fluctuations of the various elements computed. *Subject Headings:* 1. Marine meteorological data 2. Equatorial meteorology 3. Indian Ocean 4. Atlantic Ocean.

1935

5A-134

551.588.1

*Defant, Albert, *Der Einfluss des Baikalsees auf das Klima seiner Umgebung*. [The influence of Lake Baikal on the climate of the surrounding lands.] *Geografiska Annaler*, Stockholm, 17:285-299, 1935. 7 figs., tables, refs., eqs. **DLC**—A case study of the moderating effect of Lake Baikal on the severe continental climate of south central Siberia. Monthly vertical and horizontal temperature distributions over the lake and surrounding territory tabulated. *Subject Headings:* 1. Lakes 2. Lake Baikal, U.S.S.R.

1936

5A-135

551.5:551.46

Schott, Gerhard, *Die Aufteilung der drei Ozeane in natürliche Regionen*. [The division of the three oceans into natural regions.] *Petermanns Geographische Mitteilungen*, 82(6,7/8):165-170; 218-222, 1936. plates, tables, refs. **DLC**—When defining the natural regions of the oceans, SCHOTT attempts to put equal emphasis on the characteristic meteorological conditions (e.g., trade winds) as well as on the oceanographical features (e.g., currents, water mass characteristics). His 39 suggested subdivisions of the Atlantic, Pacific and Indian Oceans and their relative sizes tabulated on p. 221. *Subject Headings:* 1. Geography 2. Oceans.

1939

5A-136

551.554(26)

Ulanov, Kh. K., *Izmenenie skorosti vetra s vysotoi nad morem*. [The change of the velocity of wind with height above the sea.] *Akademiia Nauk SSSR, Izvestiia, Ser. Geogr. i Geofiz.*, No. 3:308-314, 1939. 3 figs., 7 refs., 3 eqs. In Russian; English summary, p. 313-314. Abstract in: *American Meteorological Society, Bulletin*, 23(2): 81, Feb. 1942. **DLC**—Wind velocity observed at heights of 30, 100, 200 and 300 cm above a raft and simultaneous humidity and temperature observations at 10 or 20, 50, 100 and 200 cm were carried out during the White Sea expedition of the State Hydrological Institute (U.S.S.R.) in the summer of 1938. Results show vertical distribution of velocities (30-300 cm above sea) not in agreement with Rossby theoretical curves, wind velocity distribution with height not dependent on stratification of temperature in layer 2-3 m above sea, vertical gradient of wind velocities increasing with increasing velocity, and vertical gradient above 3-4 m decreasing with increasing height. *Subject Headings:* 1. Micrometeorology 2. Marine meteorology 3. Wind profiles 4. White Sea.

1940

5A-137

551.513.2:551.515 551.465

Defant, F., *Trägheitsschwingungen im Ozean und in der Atmosphäre*. [Inertia oscillations in the ocean and the atmosphere.] *Berlin. Universität. Meteorologisches Institut, Veröffentlichungen*, 4(2), 1940. 66 p. 18 figs., 11 tables, 21 refs., numerous eqs. **DLC**—Theory of inertia oscillations as a result of a disturbance of a steady stream on the rotating earth is developed and their propagation in water and air analyzed, considering also separately the effect of friction. Furthermore, the drift stream theory is outlined for sudden and slow changes of the wind or the pressure field in the ocean. The theoretical results are compared with oceanographic observations and also with atmospheric phenomena, namely oscillations of wind velocity and of the isobaric field. *Subject Headings:* 1. Inertia oscillations 2. Ocean currents 3. Atlantic Ocean 4. Europe.—A.A.

- 5A-138** 551.574.1
Wright, H. L., *Sea-salt nuclei*. *Royal Meteorological Society, Quarterly Journal*, 66(283):3-12, Jan. 1940. fig., table, refs. **DWB**—A summary of the published data on the origin, composition, behavior, and size distribution of sea salt nuclei. *Subject Heading: 1. Saline nuclei.*

1941

- 5A-139** 551.5:551.46
†Carruthers, J. N., *Some interrelationships of meteorology and oceanography*. *Royal Meteorological Society, Quarterly Journal*, 67(291):207-246, 1941. 13 figs., 36 refs., 4 appends. Also: Callendar, G. S., *The ocean's influence on weather*. *Ibid.*, p. 383-384. And: Frankcom, E. N., *Some interrelationships of meteorology and oceanography*. *Ibid.*, p. 384-385. **DWB**—Survey of some of the outstanding literature on various phases of oceanography and meteorology and their interrelationships combined with a discussion of wind effects of water with special emphasis on variations of the Gulf Stream and resultant influences on European weather. Much information drawn from C. O'D. ISELIN's 1940 paper on long period variations in the transport of the Gulf Stream. Three brief appended articles present the findings (about wind and water movement) of scientists whose preoccupations have been largely with fishery matters. *Subject Headings: 1. Marine influences 2. Gulf Stream variations 3. Fishing industry. I. Callendar, G. S. II. Frankcom, E. N.*

1942

- 5A-140** 551.588.1(85)
Schweigger, Erwin, *Los fenómenos en el mar desde 1925 hasta 1941, en relación con observaciones meteorológicas efectuadas en Puerto Chicama*. [Phenomena in the sea from 1925 until 1941 in relation to meteorological observations recorded at Port Chicama.] (In: *Tres estudios referentes a la oceanografía del Peru*. [Three studies on the oceanography of Peru.] Lima, Peru, [Irón Junín [1942]].) 64 p. 7 graphs, 12 tables, bibliog. p. 64. **DLC**—Basing his remarks on data collected at Port Chicama, the author expands his discussion to cover the general interrelation of sea and atmosphere on the Peruvian coast as well as the effects of that interrelation witnessed during specified years. The barometric pressure pattern is cited as one of the chief factors controlling winds and sea and air temperatures. Special mention is made of the current called "El Niño" which brings torrential rains to Peru and severe losses to the key guano industry. *Subject Headings: 1. Marine influences 2. El Niño Current 3. Peru.*

1943

- 5A-141** 551.509.58(265/6)
Riehl, Herbert and Elford, C. Robert, *Ocean analysis from coastal reports*. Chicago. University. *Institute of Meteorology, Misc. Report*, No. 9, March 1943. 18 p. 15 figs., 2 tables, 9 refs. **DWB**—A method is outlined for obtaining weather estimates and forecasts of a general nature over any ocean area of the middle and high latitudes for which aerological data from adjacent shores are available. The method of reconstructing the weather conditions over the ocean from shore data is illustrated by the analysis of two different weather situations over the northeast Pacific Ocean, using reports from the Pacific Coast, Alaska, and Honolulu only. Two independent analyses of each case were prepared to demonstrate that two forecasters using this method should arrive at the same conclusions. (*Same item as 3E-48*, May 1952, *MAB.*) *Subject Headings: 1. Objective forecasting 2. Marine meteorology 3. Pacific Ocean.*

- 5A-142** 551.554:532.59
Westwater, F. L., *Wind structure over the sea*. *Royal Meteorological Society, Quarterly Journal*, 69(301):207-213, July 1943. 6 figs., 4 refs. **DWB**—From observations on aircraft carriers frequency distributions of angles between surface wind and isobars are constructed for SE Trades (mean back 4°) and Atlantic-Mediterranean (mean veer 8°). The distributions are asymmetric and it is suggested that this is due to difference between wave speed and wind speed. The backing in SE Trades and small veer in Atlantic are attributed to ocean currents moving with the wind and reducing or overcoming friction. *Subject Headings: 1. Marine meteorology 2. Winds at sea.—C.E.P.B.*

1946

- 5A-143** 550.342:551.515.2
Gillmore, Marion H., *Microseisms and ocean storms*. *Seismological Society of America, Bulletin*, 36(2):89-119, April 1946. 15 figs. **MWB**—Method described for determining at a tripartite station direction microseismic waves are travelling. Figures compare microseismic activity at Guantanamo Bay, Cuba, with hurricane tracks in 1944 and 1945. Remarkable case of microseisms at Richmond, Fla., which doubled in amplitude simultaneously with a wind increase from 55 to 85

knots in a hurricane approximately 150 miles distant used to add weight to theory that microseisms are produced by some force within the hurricane itself rather than by surf. *Subject Headings:* 1. Microseismic storm tracking 2. Hurricane tracking 3. Caribbean Area.

5A-144

551.507.2

Nine nations act on ocean weather station program. *Air-Sea Safety*, Wash., D. C., 1(1):25-38, Nov. 1946. photos., chart. DWB—After an introductory discussion of the importance of weather observations from ocean areas and resumé of attempts during the war to provide such reports, the terms of the 1946 International Agreement on North Atlantic Ocean Weather Stations are listed. A chart (p. 34-35) shows the location of the 13 ships comprising the proposed network. *Subject Headings:* 1. Weather ships 2. North Atlantic.

5A-145

551.46:355.463

Seiwell, H. R., Military oceanography in tactical operations of World War II. *American Geophysical Union, Transactions*, 27(5):677-681, Oct. 1946. 2 refs. See also article by same author in *Military Engineer*, 39(259):202-210, May 1947. DWB—An account of the organization and work (planning of major amphibious operations, publication of the Daily Hydrographic Bulletin, forecasting state of sea) of the military oceanographic team which operated in the European and Pacific theaters of war. *Subject Headings:* 1. Military oceanography 2. World War II.

5A-146

551.551(26)

Tasson, A., La structure du vent dans les basses couches au-dessus de la mer et au voisinage d'un navire. [The structure of the wind in the lowest layers above the sea and in the vicinity of a ship.] *La Météorologie*, 4th Ser., No. 3:322-330, July/Sept. 1946. 2 figs., 4 tables, 19 refs. DWB—Author first reviews PRANDTL's and KARMAN's laws of increase of wind speed with altitude and then discusses the disturbing influence of a ship on air flow in the low levels above the sea as illustrated by the disagreement between observations at different positions on the ship and the variation of those observations with wind speed: wind speed increase with height is rapid when warm air blows over cold water, slow in reverse case. *Subject Headings:* 1. Winds at sea 2. Marine meteorology.

1947

5A-147

550.342:551.515

Gilmore, Marion H., Tracking ocean storms with the seismograph. *American Meteorological Society, Bulletin*, 28(2):73-85, Feb. 1947. 11 figs., table. DWB—A report of the first 3 years operation of the U. S. Navy Microseismic Research Project. It is concluded that deep depressions at sea do cause microseisms which, when recorded by a tripartite microseismograph station on shore, may serve as an aid in the locating and forecasting of ocean storms. *Subject Headings:* 1. Microseismic storm tracking 2. Storms at sea 3. U. S. Navy. Microseismic Research Project.

5A-148

550.342:551.509

Gutenberg, B., Microseisms and weather forecasting. *Journal of Meteorology*, 4(1):21-28, 1947. 6 figs., refs., 5 eqs. MH-BH—Certain types of microseisms are correlated with atmospheric disturbances and can be used in weather forecasting, especially in locating tropical disturbances. Publications referring to this method are mentioned. The method's routine application by the U. S. Navy Department in locating hurricanes in the Caribbean area is discussed, as well as the precautions which must be taken in drawing conclusions from the amplitudes of microseisms. *Subject Headings:* 1. Microseismic storm tracking 2. Hurricane tracking 3. Caribbean Area.—Author's abstract.

5A-149

551.501.1(26)

Jameson, H., Observing weather at sea. I. Air temperature and humidity. *Marine Observer*, 17(137):46-50, July 1947. Kirk, T. H., II. Sea surface temperature. *Ibid.*, 17(138):100-102, Oct. 1947. Jameson, H., III. The marine mercurial barometer. *Ibid.*, 18(139):30-33, Jan. 1948. Barlow, E. W., IV. Observation of cloud forms. *Ibid.*, 18(140):107-112, April, 1948. Kirk, T. H., V. Wind. *Ibid.*, 18(141):171-174, 1948. figs., photos, tables. DWB—Series of brief articles on the general techniques and difficulties of observing the various meteorological elements at sea. *Subject Headings:* 1. Marine meteorology 2. Ocean weather observation. I. Kirk, T. H. II. Barlow, E. W.

5A-150

551.509.31(26)

Kirk, T. H., The importance of ships observations to the forecaster. I. Ships' observations and the synoptic method. *Marine Observer*, 17(137):30-40, July 1947. 6 figs. II. Theoretical aspects of synoptic analysis. *Ibid.*, 17(138):83-92, Oct. 1947. 4 figs. III. Practical aspects of

synoptic analysis. *Ibid.*, 18(139):18-30, Jan. 1948. 8 figs., tables. IV. The oceans and the weather. *Ibid.*, 18(140):96-101, April 1948. 2 figs. DLC—A series of short articles attempting to give some idea of the method used by forecasters to interpret observational data, particularly over the sea and to present some aspects of the physical aspects of the interaction between atmosphere and oceans. Several ocean charts and diagrams (after BJERKNES) illustrate the text. *Subject Headings: 1. Synoptic analysis 2. Marine meteorology.*

5A-151

551.554:551.46

Woodcock, Alfred H. and Wyman, Jeffries, **Convective motion in air over the sea.** *New York Academy of Science, Annals*, 48(8):749-776, Sept. 15, 1947. 8 figs., table, 9 plates, refs. Discussion by Bernhard Haurwitz, p. 767. DLC—The classic experiments of BÉNARD, in which he observed a regime of polygonal convection cells set up in a thin layer of liquid heated from the bottom until a certain critical temperature gradient was reached, are described and the counterparts of such cells in the atmosphere pointed out. The main part of the paper consists of diagrams, photographs and explanations of the convection patterns displayed by smoke screens laid down at sea. Systematic dark and light bands on the sea surface lying parallel to the wind were explained tentatively as evidence of either longitudinal roll vortices in the air or a system of internal waves in the mixed surface layer. *Subject Headings: 1. Convection over the sea 2. Marine meteorology.—Author's abstract.*

1948

5A-152

551.507.2

Brown, J. E., **The sea-going meteorologist's aspect of work in ocean weather ships.** *Weather* 7(7):216-218, July 1948. fig., photos. DWB—Brief description of the space allocation on board British weather ship, "Weather Watcher" and account of difficulties associated with upper air soundings in heavy weather. *Subject Headings: 1. Weather ships 2. Upper air soundings 3. North Atlantic.*

5A-153

550.342:551.506(26)

Neis, B., **Mikroseismik und Wetter.** [Microseisms and weather.] *Zeitschrift für Meteorologie*, 1(1/2):1-10, Jan./Feb. 1948. 3 figs., chart, 10 refs. DWB—First part deals with wind waves and surf as causes of microseismic activity recorded at shore station. Second part compares microseismic activity in Europe with major weather patterns over the Atlantic. *Subject Headings: 1. Microseisms 2. Europe 3. Atlantic Ocean.*

5A-154

551.507.2

Ocean weather ships. *Esso Air World*, New York, 1(4):94-95, Sept. 1948. illus. DWB—Brief, illustrated account of the meteorological and air-sea rescue work of the thirteen ocean weather ships maintained in the North Atlantic by nine nations under an international agreement reached in London, Sept. 1946. *Subject Headings: 1. Weather ships 2. North Atlantic.*

1949

5A-155

551.5:551.46

Barlow, E. W., **The contributions of the merchant seaman to oceanography and some aspects of the interrelation between meteorology and oceanography.** *Marine Observer*, 19(143):41-48, Jan. 1949. 5 figs. Abstract of paper read before Challenger Soc., London June 23, 1948. Original unchecked. DLC—Description of the charts compiled by the British Meteorological Office from current observations supplied by merchant seamen and brief comments on the meteorological effects of the difference between sea and air temperatures. *Subject Headings: 1. Ocean current charts 2. Marine influences 3. Sea temperature variations 4. Merchant marine.*

5A-156

551.515.7:551.513.7

Becker, Richard, **Der planetarische Jahresgang der maritimsubtropischen Hochdruckkerne.** [The planetary annual variation of the maritime-subtropical anticyclones.] *Annalen der Meteorologie*, 2(1/2):48-51, Jan./Feb. 1949. figs., 8 refs. English summary. p. 48. DWB—Over the continents in each hemisphere, pressure is high in winter and low in summer. The subtropical anticyclones over the oceans on the other hand reach their greatest development in June or July in both hemispheres. The explanation given is that the evacuation of air from the great northern continents in summer, due to the great annual range of temperature, raises the pressure over all the rest of the world, but earlier in the northern oceans (June) than in the southern (July). (Same as 2-95, Feb. 1950, *MAB.*) *Subject Headings: 1. Anticyclones 2. Dynamics of the atmosphere.—M.R.*

5A-157

551.501.1 (26)

Frankcom, C. E. N., *The merchant seaman as a meteorologist*. *Marine Observer*, 19(143):34-41, Jan. 1949. 4 figs. Abstract of paper read before Challenger Soc., London, June 23, 1948. Original unchecked. **DLC**—Account of the pressure, air and sea temperature, humidity, wave and current observations taken aboard merchant vessels at six hour intervals and radioed to meteorological centers of countries desiring them. *Subject Headings*: 1. Marine meteorological observations 2. Merchant marine.

5A-158

551.582 (26)

Jameson, H., *Ships' observations and the climatologist*. I. The collection of the observations. II. The representation of observations by isopleths. III. The representation of vector quantities. IV. The representation of high and low values. *Marine Observer*, 18:161-165; 219-222, 1948 and 19:50-55; 103-104, 1949. figs. **DWB**—In Pt. I, the system of Marsden (10°) squares used in marine climatology is briefly described. Pt. II deals with the representation of marine observations, involving only one constituent, by isopleths. Pt. III is concerned with the charting of vector quantities such as wind and current which involve two constituents, namely magnitude and direction. Pt. IV explains use of five percentile maximum and minimum temperatures on British marine climatological charts. *Subject Heading*: 1. Marine climatology.

5A-159

551.583.3 (26)

Ovey, C. D., *Note on the evidence for climatic changes from sub-oceanic cores*. *Weather*, 4(7):228-231, 1949. fig., photo., 5 refs. **DWB**—From cores obtained by use of the Kullenberg piston core-sampler used on the Swedish Deep Sea Expedition, 1947-48, with the "Albatross" (see 5A-82 above), past climatic changes can be detected over a period of at least a million years. Present evidence shows that the tropics were colder than today and icebergs flowed at least as far south as the Azores. *Subject Headings*: 1. Climatic changes 2. Ice ages 3. Sub-oceanic cores.

5A-160

551.501.1:656.6 (02)

Tannehill, Ivan R., *Preparation and use of weather maps at sea*. 3rd ed. *U. S. Weather Bureau, Circular R*; W.B. No. 1151, 2d Revision, 1949. 117 p. 64 figs., fold. map, 2 tables, append. With 37 code tables. **DWB**—This new edition of *Circular R* includes all of the necessary tables and specifications of the Toronto code (effective Jan. 1, 1949), and in addition to instructions for plotting and analyzing simple weather charts, a great deal of information and illustrations on air masses, fronts, disturbances, tropical cyclones, the general circulation, centers of action, wind systems, squalls, fog, etc. The section on observing and predicting hurricane movements by winds, swells, clouds, etc., is quite complete. (Same item as 9-12, Sept. 1950, *MAB*.) *Subject Headings*: 1. Marine meteorology 2. Instruction for observers 3. Manuals. I. U. S. Weather Bureau.—*M.R.*

5A-161

551.5:551.46

Thomson, Andrew, *The meteorologist looks at the oceans*. *Royal Society of Canada, Transaction*, Ser. 3, vol. 43, Sect. 5:157-162, 1949. table. **DLC**—Importance of meteorological observations at sea and knowledge of heat exchange over the sea discussed. Climatic effect of wind blowing over open and frozen water mentioned with emphasis on the Hudson Bay region. *Subject Headings*: 1. Marine meteorology 2. Marine influences 3. Hudson Bay.

5A-162

551.574.1

Woodcock, Alfred H. and Gifford, Mary M., *Sampling atmospheric sea salt nuclei over the ocean*. Woods Hole Oceanographic Institution, Marine Meteorology, Contract N6onr-277, Task Order II, NR-082-021, Technical Report No. 1, Jan. 1949. 32 p. 14 figs., photos, tables, numerous refs. With a supplement by Mary M. Gifford, *Efficiency of deposition of nuclei on "ribbons" one millimeter wide*. p. 30-32. Also in: *Journal of Meteorology*, 8(2):177-197, Oct. 1949. **DWB**—A method of sampling air-borne sea-salt nuclei over the open ocean is described. Data are given showing the distribution of the weight and number of nuclei up to a height of 305m (fig. 11). It is suggested that those sea-salt nuclei act as condensation nuclei in the formation of sea fogs. The range of the weights is comparable to the range of average weights measured at shore stations by other authors. *Subject Headings*: 1. Saline nuclei 2. Condensation nuclei 3. Marine meteorology. I. Woods Hole Oceanographic Institution II. Contract N6onr-277.—*Authors' abstract*.

1950

5A-163

551.574.1

Aliverti, G. and Lovera, G., *Sui nuclei di condensazione di origine marittima*. [On condensation nuclei of maritime origin.] *Geofisica Pura e Applicata*, 16(3/4):133-135, April/June 1950. 4 refs. Italian and English summaries p. 133. **MH-BH**—Calculation of the probable number of saline

condensation nuclei taken by the atmosphere from the sea under various conditions. Critical evaluation of similar calculations made by G. C. SIMPSON and by H. KOHLER. Effect of bubbling and of sea spray discussed. (Same item as 2.4-123, April 1951, MAB.) *Subject Headings: 1. Condensation nuclei 2. Saline nuclei.—M.R.*

5A-164

551.311.181

*Fukutomi, Takaharu; Kusunoki, Kou and Tabata, Tadasu, *Study of sea-ice, 3rd-8th, 15th reports. Teion Kagaku (Low Temperature Science)*, Sapporo, Japan, 3:131-206, 1950; [15th report] 8:59-88, 1951. figs., tables, eqs., refs. In Japanese, English summary at end of each report. DWB—Elaborate studies of formation, extent, depth, etc. of ice along shores and in the Okhotsk Sea depending on temperature, salinity, depth, wind conditions, cyclonic storms, etc. Some years the whole Okhotsk Sea is frozen except where warm currents enter. Total amount averages $120 \times 10^{10} \text{ m}^3$ in a winter. A statistical method of predicting first and last ice on Hokkaido coast is worked out from preceding conditions at Abashiri. The entire series is accompanied by data and curves or charts. *Subject Headings: 1. Sea ice 2. Sea ice forecasting 3. Okhotsk Sea.—M.R.*

5A-165

551.5:550.83

Glenn, Alfred H. and Bates, Charles C., *The meteorological and oceanographic aspects of geophysical prospecting. Geophysics*, Menasha, Wisc., 15(2):247-256, April 1950. 2 figs., 2 tables, 2 refs. DGS—Authors discuss the relationship of the professional consulting meteorologist to the Weather Bureau and special applications of industrial climatology and of oceanography to offshore oil drilling operations. Applications of short range forecasting and of punched card technique to forecasting weather and wave conditions required for special operations, for scheduling work areas, for planning exploration and for determining soil trafficability are considered. Importance and need for investigating microseisms, the dynamics of sedimentation with special reference to tides, wave refraction and current patterns are stressed. (Same item as 2.8-10, Aug. 1951, MAB; see also 3-133, March 1950, MAB.) *Subject Headings: 1. Industrial meteorology 2. Industrial oceanography 3. Off shore oil industry.—I.L.D.*

5A-166

551.46(47)

Lednev, V. A. and Rudovits, L. F., *Ob okeanograficheskikh rabotakh SSSR za poslednie tridsat' let.* [On oceanographic work of the USSR during the past thirty years.] *Meteorologiya i Gidrologiya*, No. 4:14-17, Dec. 1950. DLC—A paper summarizing the progress and results of oceanographic investigations carried out by the official Oceanographic and Marine Biological Institutes during the past 30 years, and by the Marine Hydrophysical Institute, the Oceanographical Institute of the Akademiia Nauk and the Marine Hydrophysical Laboratory at Kotsiveli on the Black Sea. Research has been performed in the Arctic Seas, the Black and Azov Seas and the Pacific Ocean and adjacent seas. *Subject Headings: 1. Oceanographic research 2. Progress in oceanography 3. U.S.S.R.—A.M.P.*

5A-167

551.501.81:551.507.2

Milburn, K., *Radar in ocean weather ships. Marine Observer*, 20(147):40-44, 55, 56, Jan. 1950. 2 figs. DWB—General review of the use of radar. Synoptic forecasting in the North Atlantic is limited in detail, yet of importance to aircraft due to localization of fronts and presence of thunderstorms. (Same item as 5-18, May 1950, MAB.) *Subject Headings: 1. Radar equipment 2. Radar storm detection 3. Weather ships 4. North Atlantic.—M.R.*

5A-168

551.558.1(26)

Millar, F. Graham, *Air currents revealed by soaring gulls. Marine Observer*, 20(149):154-157, July 1950. 2 figs., 3 refs. MH-BH—Gulls soar over open sea in updrafts between convection cells when sea is warmer than air and wind force is 4 or less. Circulation can also be observed in drift of floating objects and in steam fog. (Same item as 2.1-127, Jan. 1951, MAB.) *Subject Headings: 1. Convection over the sea 2. Bird soaring.—C.E.P.B.*

5A-169

551.511:551.543

Prager, Erwin, *Zur Frage der Erwärmung kalter Festlandsluft nach ihrem Übertritt auf See.* [On the question of warming of cold continental air after its passage over the sea.] *Annalen der Meteorologie*, 3(1/2):10-19, Jan./Feb. 1950. 6 figs. English summary p. 10. DWB—Observations are presented during two cold periods 14-25 Dec. 1946 and 1-12 Jan. 1947 at coastal stations and lightships off NW Germany. Sea temperature was +5 to 10°C, decreasing slowly. Air temperature was -5 to -15°C at Hamburg and Jever but averaged 10°C higher (on extreme days over 15° higher) at lightships. Rate of warming about 0.3°C per 10 km. Structure of air shown by

temperature and equivalent potential temperature from radiosondes at Hamburg and Jever. The cold air was thin, not reaching 900 mb, with an inversion above; this is the normal condition. (Same item as 6-48, June 1950, MAB.) *Subject Headings:* 1. Air mass modification 2. Energy exchange sea-atmosphere 3. Marine influences.—C.E.P.B.

5A-170

551.46:551.509.33

Queney, P., *Contribution éventuelle de l'océanographie aux prévisions météorologiques*. [Possible contributions of oceanography to meteorological forecasting.] *France. Comité Central d'Océanographie et d'Études des Côtes, Bulletin d'Information*, 2(6):201-208, 1950. **DLC**—Contributions to long range forecasting and fluctuations in surface circulation of the ocean are discussed. The theory of the effects of such fluctuations on the atmosphere is set forth and confirmed by observations on the coasts of Norway and Peru. Remarks by J. BESSEMOULIN on the atmospheric and oceanic circulation include a discussion of the annual evolution of these circulatory systems and their interdependence. *Subject Headings:* 1. Marine influences 2. Long range forecasting 3. Oceanic circulation. 1. Bessemoulin, J.

5A-171

551.510.42

Woodcock, Alfred H., *Sea salt in a tropical storm*. *Journal of Meteorology*, 7(6):397-401, Dec. 1950. 4 figs., 2 tables, 6 refs. Also: *Woods Hole Oceanographic Institution, Contribution*, No. 528. **MH-BH**—Air-borne sea salt in a tropical storm was sampled at Pompano, Florida. The method of sampling is described and the sea salt per cubic centimeter of air was measured by titration and the isopiestic method. The atmospheric sea salt determinations by these methods are similar in magnitude. The weight and number distribution of sea salt nuclei resembles that found in the same area during moderate winds. The hygroscopic properties of sea salt nuclei are discussed. The weight of water condensed in the nuclei can be determined by the equation $W_w = W_s(C^{-1} - 1)$, where W_w is weight of water present, W_s is weight of sea salt and C is concentration of sea salt by weight fraction. The increase in air temperature is determined by the equation $\Delta T = W_w LC_p$; where ΔT is increase in air temperature, L heat of vaporization of water and C_p is specific heat of moist air. Significant amounts of latent heat were released below 100% relative humidity. (Same item as 2.4-52, April 1951, MAB.) *Subject Headings:* 1. Saline nuclei 2. Hurricanes 3. Florida.—I.L.D.

5A-172

551.588

Wundt, Walter, *Die hydrographische und klimatische Auswirkung der Abdämmung von Meeresengen*. [The hydrographic and climatic results of damming up ocean straits.] *Petermanns Geographische Mitteilungen*, Gotha, 94(4):212-215, 1950. 7 refs. **DLC**—An interesting account of possible international ocean-strait damming projects which could be undertaken in the Baltic, Black Sea, Red Sea, Mediterranean, etc. Associated land reclamation, political repercussions, climatic change and increased water power supply discussed. *Subject Headings:* 1. Damming ocean straits 2. Land reclamation.

1951

5A-173

551.5:551.46

Aliverti, Guiseppina, *L'atmosfera e gli oceani, analogie e interdipendenze*. [The atmosphere and the oceans, analogies and interdependencies.] *Rivista di Meteorologia Aeronautica*, Rome, 11(2):3-12, April/June, 1951. 12 figs., 4 refs. Italian, French, English and German summaries, p. 3. **MH-BH**—A review of the main contributions to meteorology by oceanographers and vice-versa. The particular contributions of DEFANT, BJERKNES, PETTERSON, SVERDRUP and JACOBS are discussed and several of their charts reproduced to illustrate the temperature distribution in the sea, radiation and energy exchange between sea and atmosphere. The analogies between the two sciences and the need for meteorologists to broaden the scope of their research is stressed. (Same item as 3.11-25, Nov. 1952, MAB.) *Subject Headings:* 1. Marine meteorology 2. Energy exchange sea-atmosphere.—M.R.

5A-174

551.583(26)

Brooks, Charles E. P., *Oceans through the ages*. *Marine Observer*, 21(152):103-110, April 1951. 2 figs., tables. **DWB**—Brief description of origin and history of the oceans, ocean currents and weather of warm periods and of Quaternary and Permo-Carboniferous ice ages. Ends with an account of ocean changes in Post-glacial. (Same item as 2.10-160, Oct. 1951, MAB.) *Subject Headings:* 1. Oceans 2. Climatic changes.—C.E.P.B.

5A-175

551.507.2

Frankcom, C. E. N., *The international operation of Ocean Weather Station "Mike"*. *Marine Observer*, 21(151):23-25, Jan. 1951. **DWB**—Description and photo of O.W.S. "Polarfront I" now

maintained jointly by Norway, Sweden, Belgium and Denmark in 66°N, 2°E. (Same item as 2.8-18, Aug. 1951, MAB.) *Subject Headings:* 1. Marine meteorology 2. Weather ships 3. Norwegian sea.—C.E.P.B.

5A-176

551.511:551.524.4:551.526.6

†Jacobs, Woodrow Cooper, *Large-scale aspects of energy transformation over the oceans.* (In: *Compendium of meteorology.* Boston, American Meteorological Society, 1951. p. 1057-1070. 4 figs., 8 tables, 41 refs.) **MH-BH**—Comprehensive and clear account of the "large scale and more or less long-term (average) aspects of the convective transfer of energy between sea and atmosphere." Discussion covers: 1) rate of exchange of sensible heat, 2) rate of exchange of energy in the latent form of water vapor, 3) rate of total heat loss from the oceans through convection, and 4) rate of total heat gain by the atmosphere through convection. (For fuller abstract see item 4.1-5, Jan. 1953, MAB.) *Subject Headings:* 1. Energy exchange sea-atmosphere 2. Marine meteorology.—I.L.D.

5A-177

551.46

†Lineikin, P. S., *O nekotorykh voprosakh teoreticheskoi okeanografii.* [Some problems of theoretical oceanography.] *Voprosy Geografii*, No. 26, *Gidrologiia*, p. 220-234, 1951. bibliog. 232-234. **DLC**—Author summarizes 23 current problems which should be solved in regard to sea currents (steady and unsteady drift currents, influence of moving cyclones, influence of bottom and seashore configurations, etc.), to wind waves (initial wind velocity, unsteady cases, refraction of waves, forecasting, etc.), to tidal flow and seiche phenomena (forced oscillations, flow tides in seas with ice cover, etc.), to the dynamics of ice cover (drift of ice fields, ice pressure, growth of ice, etc.), as well as in regard to turbulent mixing of water masses (unsteady case of thermal convection, heat transfer caused by the wind field in a homogeneous and nonhomogeneous sea). The short discussions of each problem in connection with the comprehensive bibliography give a fair idea of results to date of Russian research. A few foreign references are included. *Subject Headings:* 1. Oceanographic theory 2. Ocean currents 3. Sea ice 4. Turbulent mixing of water 5. U.S.S.R.—A.A.

5A-178

551.513.1:551.556

Priestley, C. H. B., *A survey of the stress between the ocean and atmosphere.* *Australian Journal of Scientific Research, Ser. A., Physical Sciences*, 4(3):315-328, Sept. 1951. 4 figs., 3 tables, 10 refs., 4 eqs. **MH-BH**—A survey is made of the mean east-west component of stress between the ocean and atmosphere for each season and each ocean, and for the mean of all oceans. The averaging is carried out for each 5° latitude zone from 55°N to 55°S. The result provides a first approximation to the total torque about the earth's axis, on the atmosphere as a whole, in the various latitude belts. From them is derived a table showing the distribution of total northward flux of atmospheric angular momentum for the annual mean and the four seasons individually, allowing for the changes occurring during spring and autumn. A brief comparative discussion of both the stress and flux results is given. (Same item as 3.5-9, May 1952, MAB.) *Subject Headings:* 1. Marine meteorology 2. Ocean-atmosphere stress 3. Energy exchange sea-atmosphere 4. Atmospheric circulation 5. Angular momentum flux.—A.A.

5A-179

551.573(26)

Sverdrup, Harald Ulrik, *Evaporation from the oceans.* (In: *Compendium of meteorology.* Boston, American Meteorological Society, 1951. p. 1071-1081. 3 figs., 2 tables, 30 refs., 37 eqs.) **MH-BH**—Various methods for determining evaporation from the ocean reviewed are: 1) extrapolation from land values, 2) direct measurements at sea, 3) computation of evaporation from meteorological elements at sea. History of each method given, fundamental equations developed, theoretical considerations analyzed and results obtained presented. (Same item as 4.7-8, July 1953, MAB.) *Subject Headings:* 1. Evaporation from seas 2. Evaporation measurement 3. Marine meteorology.—I.L.D.

5A-180

551.46:06

Zenkevich, L. A., *Rabota sovetskikh okeanologov v 1949-1950.* [Work of Soviet oceanologists in 1949-1950.] *Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr.*, No. 1:79, 1951. [Note.] **DWB**—Soviet advance in oceanology is noted. Material on processes occurring at bottoms of different seas has been assembled. Since 1949 investigating expeditions have proceeded under supervision of the author aboard a special floating laboratory. (See 5A-166 above.) *Subject Headings:* 1. Oceanographic research 2. Oceanographic research laboratories 3. U.S.S.R.—A.M.P.

1952

5A-181

551.515(265):550.342

Alcaraz, Arturo and Kintanar, Roman (*Weather Bur. Manila*). *Pacific microseisms.* *International Union of Geodesy and Geophysics, Association of Seismology. Publications du Bureau Central*

Séismologique International, Ser. A, Travaux Scientifiques, No. 18:109-125, 1952. 4 figs., refs. **DWB, DLC**—The Microseismic Research Project of the U. S. Navy was extended to the Pacific in 1945. In 1949 the Philippine Weather Bureau established a tripartite microseismic station and carried out daily exchanges of data with the Navy's station at Guam. Paper discusses microseisms recorded at the Bureau station in Diliman, Quezon City, over a two year period, with particular emphasis on their relation to atmospheric disturbances over the Pacific Ocean. A few conclusions are presented for discussion and as a means of comparison with Caribbean findings. The occasional recording of very short period microseisms is also mentioned. *Subject Headings: 1. Microseismic storm tracking 2. Storms at sea 3. Quezon City, Philippine Islands 4. Pacific Ocean.*—*Authors' abstract.*

5A-182

551.46

Deacon, G. E. R., *Progress in oceanographical research. Institute of Navigation, London, Journal*, 5(2):168-173, April 1952. 11 refs. **MWB**—A review of the various problems of oceanography and marine meteorology in which previous basic research has been sorely lacking and plea for a continuing scientific and analytical approach. *Subject Heading: 1. Oceanographic research.*

5A-183

550.342:551.515.2

*Donn, William L. and Blaik, Maurice, *A study and evaluation of the tripartite seismic method of locating hurricanes. Columbia University. Lamont Geological Observatory, Contract N6-onr-27133, Technical Report on Seismology No. 19, Feb. 1952. 20 p. 7 figs., table, 13 refs. DWB*—Even when storm azimuths were computed in two different ways, the error between them and observed values remained too large to render the tripartite seismic method practical for locating hurricanes. Data studied were from U. S. Navy stations at Bermuda, Cherry Point, and Miami. Verification may improve considerably with the elimination of errors resulting from "instrumentation and procedure, lack of wave coherence at the three elements of the tripartite net, and refraction or multiple wave paths." *Subject Headings: 1. Hurricane forecasting 2. Microseismic storm tracking. I. Columbia University. Lamont Geological Observatory II. Contract N6-onr-27133.*

5A-184

551.509(02)

*Elliott, Robert D. and Kerr, Raymond E., Jr., *Handbook of single station analysis and forecasting techniques. Aerophysics Research Foundation, Santa Barbara, Calif., Contract N189s-86995, Report 52-3, Oct. 1952. 98 p. 50 figs., 8 tables, refs. Suppl. No. 1, ibid., July 1953. 112 p. 53 figs., tables, refs. DWB*—One of the best recent scientific reports, giving much more than could be deduced from the title. Besides explaining forecasting techniques on the basis of aerological data from a single station by use of time hodographs and time cross sections, and giving detailed practical instructions especially on the specific use of upper air soundings, the handbook provides a valuable insight into some extended forecasting techniques developed in the United States during the last decade, based mainly on the analysis of waves in the 500 mb surface and the effect of blocking highs on the general circulation. Data are given for the components of the mean monthly geostrophic wind at 500 mb (30°-70°N; 95°-65°E) and for mean monthly heights of the 500 mb surface (180°W-70°E for 30, 40 and 50°N). Mean map of the 500 mb surface for each month, covering North America, and North Atlantic and Europe included. Other maps show mean sea surface temperature for Feb., May, Aug. and Nov. A valuable feature is an atlas of 6 typical winter and 6 summer weather situations for the North Atlantic, classified according to the location of the blocking High. The maps give a combined presentation of the characteristic features at the 500 mb level (contours, typical movements of high or low centers, location of blocking highs and trapped lows), as well as at sea level (location of surface highs and typical depth of cyclonic centers and mean storm tracks derived in objective way from the isolines of cyclonic density.) The supplement gives similar, well-prepared information for the North Pacific and, in addition, charts indicating the persistence and location characteristics of blocking for both the North Atlantic and North Pacific. Cyclone models are presented based on parameters detectable by the single station forecaster, depending on the specified sector of the long wave. *Subject Headings: 1. Forecasters manuals 2. Single station forecasting 3. Tropospheric data 4. North Atlantic 5. North Pacific. I. Aerophysics Research Foundation, Santa Barbara, Calif. II. Contract N189s-81138 III. U. S. Bureau of Aeronautics (Navy), Project AROWA.—A.A.*

5A-185

551.571.35:551.553:551.524.36:551.526.6(261)

Gordon, Adrian Hugo, *Relation of atmospheric humidity at low levels over the sea to wind force and the difference in temperature between air and sea. Meteorological Magazine, London* 81(964):289-295, Oct. 1952. 7 figs., 3 refs. **DWB**—Difference between e_0 (saturation pressure at sea temperature T_s) and e_h (v.p. at ship's bridge) increases nearly linearly with increase of difference, bridge temperature $T_h - T_s$, up to $T_h - T_s = 0$ (wind force 0-3) to above 6°F (force >6). Data for all British Ocean Weather Ships up to 1950 are plotted. Frequencies of relative humidity are

Similarly examined; R.H. increases with wind force and tends to be high with $T_h > T_s$ or $T_s - T_h \leq 10^\circ +$; R.H. is low when $T_s - T_h = 0 - 10^\circ \text{F.}$ (Same item as 4.3-190, March 1953, MAB.) *Subject Headings:* 1. Humidity variations 2. Sea temperatures 3. North Atlantic.—C.E.P.B.

5A-186 551.558.1:551.553.11
*Malkus, Joanne Starr and Bunker, Andrew F., *Observational studies of the air flow over Nantucket Island during the summer of 1950.* Woods Hole Oceanographic Institution, Contract N6onr-27702, NR-082-021, Project Marine Meteorology, Technical Report No. 15, Sept. 1951. 48 p. 41 figs., 18 tables, 9 refs. Stern, Melvin E. and Malkus Joanne Starr, *Airflow over a heated island.* *Ibid.*, Technical Report No. 18, April 1952. 47 p. diagrs., refs., eqs. DWB—During the summer of 1950, eight individual case studies were made of air flow, cloud and aerological conditions over Nantucket Island. Since the island is nowhere higher than 15 m above sea level, and there are no topographic obstructions or latitudinal factors to consider, it is thought that this study will give a good picture of the effect of local heating on a marine air mass. Cloud photographs, airplane soundings, cross sections and air flow diagrams are presented for each case, with some discussion. In addition to usual temperature, humidity and wind data for various heights, the turbulence index, water temperatures, heat flow at ground and solar radiation records are presented. In No. 18, the streamlines of the mean convective motions arising as the result of the passage of a stable atmosphere over a heated island are investigated. The effects of changes of wind speed, stability and eddy conductivity on the streamlines are pictured, discussed and compared with observations. (Same item as 4.8-160 and 4.10-9, Aug. and Oct. 1953, MAB.) *Subject Headings:* I. Marine meteorology 2. Air flow over islands 3. Convective clouds 4. Turbulence index 5. Cloud photography 6. Nantucket Island. I. Woods Hole Oceanographic Institution II. Contract N6onr-27702 (NR-082-021) III. Stern, Melvin E.—M.R.

5A-187 551.46
National Academy of Sciences, Washington, D. C. Committee on Oceanography, *Oceanography, 1951; a report on the present status of the science of the sea.* Washington, National Academy of Sciences, National Research Council, 1952. 36 p. photos. DLC—Outline of recent accomplishments in basic oceanographic research and discussion of applications of oceanography in peace and war precede a brief review of the resources in facilities, personnel and income available in the U. S. for the support of oceanographic research. Committee's recommendations for government support and for international cooperation found on p. 27-28. *Subject Headings:* 1. Oceanographic research 2. United States.

5A-188 551.46:06(497.1)
Pax, Ferdinand, *Jugoslavische Meeresforschung.* [Yugoslav marine investigation.] *Naturwissenschaftliche Rundschau*, 5(11):462-464, Nov. 1952. fig. DWB—The Institute for Marine Investigation and Sea Fisheries at Split, founded 1930, includes physiographic, biological and fishery sections. A general account of the organization and researches is given. *Subject Headings:* 1. Oceanographic research 2. Split, Yugoslavia. Institut za Oceanografiju i Ribarstvo 3. Yugoslavia.—C.E.P.B.

5A-189 551.591.3(26)
Rouch, Jules Alfred Pierre, *Mesure de la visibilité au dessus de la mer.* [Visibility measurement at sea.] *Geophysica Pura e Applicata*, 21:41-42, 1952. eq. English summary p. 41. MH-BH—Measuring the distance to the clearly visible horizon at sea provides a good means of estimating visibility which itself is an indicator of air-sea temperature spread, air mass characteristics, frontal patterns, turbulence, etc. (Same item as 3I-268, Sept. 1952, MAB.) *Subject Headings:* 1. Visibility measurement 2. Visibility at sea 3. Air-sea temperature variations 4. Marine meteorology.

5A-190 551.515.8(99)
*Schmitt, W., *Two intensive polar outbreaks in the southern oceans.* *South Africa. Weather Bureau, Notos*, 1(4):193-201, 1952. 4 figs., 3 tables, 4 refs. DWB—The features of two polar outbreaks which occurred on May 8 and May 20, 1952 are analyzed. The path of a vigorous polar outbreak on May 20, in the Palmer Peninsula and Falkland Islands region, is followed until May 30, when it reached the Kerguelen Archipelago in the central Indian Ocean and approached Amsterdam Island, where a record upper wind (RAWIN) of 252 knots at 26,000 ft was measured (on May 30) as a spectacular finale. Both this severe polar outbreak and a similar outbreak on May 8 can be traced back to the Bellingshausen Sea and the Ellsworth Highland in West Antarctica. Synoptic and aerological evidence is accumulating that the major polar outbreaks affecting the south-western Atlantic Ocean originate almost exclusively in this area. Similarly, the meteorologically important area for the eastern Indian Ocean and the Australia-New Zealand sector appears to be the northern

boundary of Enderby Land and eastern Queen Maud Land. *Subject Headings:* 1. Polar outbreaks
2. Synoptic studies 3. Antarctica.—*Author's abstract.*

5A-191

551.46:91.04

†Sewell, R. B. Seymour, *Oceanographic exploration 1851-1951*. *Science Progress*, 40(159):403-418, July 1952. 47 refs. DWB—A history of the various oceanographical expeditions and development of methods of research, and a brief survey of the present position. Ends with founding in 1949 of British National Institute of Oceanography. *Subject Headings:* 1. Oceanographic research
2. Oceanographic expeditions.—*C.E.P.B.*

5A-192

551.5:06:551.465:622.323

Shliamin, B. A., *O spetsializirovannom gidrometeorologicheskome obsluzhivanii neftianikov moria*. [On special hydrometeorological service for marine oil prospectors.] *Meteorologiya i gidrologiya*, No. 6:12-15, 1952. DLC—Report about specifications of service. The work carried out during the last years has shown that the service can be most effective when hydrometeorological observations are made close to the oil derricks. The characteristics of sea swell, ice conditions and storms and their prediction are the most important subjects of a hydrometeorological service. *Subject Headings:* 1. Hydrometeorological services 2. Off shore oil industry.—*N.T.Z.*

5A-193

551.515.1(26)

U. S. Bureau of Aeronautics (Navy), *Climatology of ocean cyclones*. U. S. Bureau of Aeronautics (Navy), Project AROWA (TED-UNL-MA-501), Task 13, Technical Report, Dec. 1952. 30 p. 2 refs., numerous charts. DWB—Monthly charts based on 1929-1938 data from the Historical Northern Hemisphere Synoptic Maps show average eastward movement, average direction of movement and a numerical analysis of speed of eastward movement of cyclones over most of the Northern Hemisphere. *Subject Headings:* 1. Storms at sea 2. Cyclone movement 3. Northern Hemisphere. I. Project AROWA (TED-UNL-MA-501).

5A-194

551.311.181:03

U. S. Hydrographic Office, *A functional glossary of ice terminology*. U. S. Hydrographic Office, H.O. Publication, No. 609, 1952. 88 p. 110 figs., bibliog. p. 87-88. Price: \$0.80. DWB—A revised, enlarged, illustrated edition of H.O. Study No. 103, "A functional glossary of ice terminology." *Subject Headings:* 1. Oceanography 2. Ice 3. Glossaries.

5A-195

551.46(06)

Wimpenny, R. S., *The International Council for the Exploration of the Sea*. *Nature*, London, 170(4335):906-908, Nov. 29, 1952. DWB—History of the Council (formed 1902), mainly to study conservation of North Sea fisheries. Includes a reference to warming up of waters of Northern Hemisphere and its effect on Arctic fisheries. *Subject Headings:* 1. Oceanographic research 2. International Council for the Exploration of the Sea.—*C.E.P.B.*

5A-196

551.574.1

Woodcock, Alfred H., *Atmospheric salt particles and raindrops*. *Journal of Meteorology*, 9(3):200-212, June 1952. 16 figs., 7 tables, 31 refs. MH-BH, DWB. Also: Woods Hole Oceanographic Institution, Contract N6onr-27702(NR-082-021), Technical Report No. 14, Sept. 1951. 28 p. photos, diagrs., graphs, bibliog. DWB—Atmospheric sea salt data are presented in the form of distribution curves which show the number of sea salt particles (of a given weight range) sampled at different altitudes plotted against the weight. Computations show that "in the process of growth the droplets containing each salt particle grow to raindrop size through coalescence with much more numerous and relatively non-saline cloud droplets. The numbers of droplets in cumulus clouds over the sea are compared to the numbers of condensation nuclei in the sub-cloud layer and the to number of larger sea-salt particles." A method of sampling the large sparsely-distributed salt particles in the atmosphere is described briefly. (Same item as 3.11-184, Nov. 1952, M.A.B.) *Subject Headings:* 1. Saline nuclei 2. Condensation nuclei 3. Marine meteorology. I. Woods Hole Oceanographic Institution II. Contract N6onr-27702(NR-082-021).

5A-197

551.574.1

Woodcock, Alfred H., *Salt nuclei in marine air as a function of altitude and wind force*. Woods Hole Oceanographic Institution, Contract Nonr-798(00), Technical Report, No. 3, Dec. 1952. 7 p. 8 figs., 12 refs. Also in: *Journal of Meteorology*, 10(5):362-371, Oct. 1953. DWB—Shows that marine atmospheres contain widely varying amounts of large sea-salt nuclei, the quantity depending largely upon altitude and wind speed. It is expected that this knowledge will prove useful in studies of rain formation over the sea, oceanic islands, and perhaps over continental land masses as well. Data show changes in numbers and sizes of sea-salt particles in marine air over the

sea as altitude, position, and time of sampling are varied. Large changes with time in the amount of airborne salt near cloud base are related to changes in wind force at the sea surface. Greater wind force is associated with increasing amounts of salt, especially at the large end of the particle weight range. Suggested that bursting air bubbles in "white caps" on the open sea are a major source of the salt nuclei. Under similar wind conditions, variations in particle number and size at various altitudes within the lower atmosphere are similar in Hawaii, Florida and South Australia. *Subject Headings: 1. Saline nuclei 2. Rain formation 3. Marine meteorology. I. Woods Hole Oceanographic Institution II. Contract Nonr-798(00).—Author's abstract.*

5A-198

551.515.2(914):550.342

Ylanan, Carlos W. (*Weather Bur. Manila*), **Typhoons and microseismic storms.** *International Union of Geodesy and Geophysics. Association of Seismology, Publications du Bureau Central Séismologique International, Ser. A, Travaux Scientifiques*, No. 18:91-107, 1952. 3 tables, 3 figs. **DWB, DLC**—Correlation between typhoons and microseismic disturbances has been the subject of study at the Weather Bureau Station at Diliman, Quezon City, during the two seasons that it has been in operation. This paper presents evaluation of the results so far obtained. Summary of the different typhoons and storms is presented together with the effects produced on the microseisms recorded with particular emphasis on amplitude. Effect of distance of the disturbance on amplitude discussed and some instances of the effect of ocean depth noted. Results point overwhelmingly to cyclonic origin of microseismic storms. *Subject Headings: 1. Microseismic storm tracking 2. Typhoons 3. Pacific ocean 4. Quezon City, Philippine Islands.—Author's abstract.*

1953

5A-199

551.5(26):06

Canfield, N. L., **Matthew Fontaine Maury and the World Meteorological Organization. 1853—a meteorological centennial—1953.** On back of: U. S. Hydrographic Office, *Pilot chart of the Indian Ocean*. Sept. 1953. chart, photos. H.O. Pub. No. 2603. **DWB**—Historical account of the growth of international meteorological cooperation from the first Maritime Conference instigated by MAURY and held at Brussels in 1853 to the birth of the World Meteorological Organization in 1951 (with its technical commission of Maritime Meteorology). WMO membership, purposes, constituent bodies and organization outlined. Resolutions of the first meeting of the WMO Commission of Maritime Meteorology listed. They show clearly the fulfillment of Maury's insistence 100 years ago on standardizing marine meteorological and oceanographic observations for all oceans. *Subject Headings: 1. World Meteorological Organization 2. History of meteorology 3. Marine meteorology 4. Maury, Matthew Fontaine 5. Maritime Conference, Brussels, 1853.*

5A-200

551.507.2

Frankcom, C. E. N., **Ocean meteorological networks.** *Marine Observer*, 23(161):151-155, July 1952. 3 maps. German summary by M. Rodewald in: *Wetterlotse*, No. 60:171-174, Aug. 1953. **DWB**—A study of the supply of weather information from the oceans by "selected ships" (see *Weather*, 8(5):140-143, May 1953; *Meteorological Magazine*, London, 82(971):146-148, May 1953). It is illustrated by world maps showing 1) position of all selected ships on Nov. 30, 1950; 2) ships sending radio reports Oct. 1, 1950, and 3) relative density of shipping. *Subject Headings: 1. Weather ships 2. Marine meteorology. I. Rodewald, M.—C.E.P.B.*

5A-201

551.311.17:06:656.61

Graves, G. van A., **International Ice Patrol.** *Marine Observer*, 23(160):109-110, April 1953. 2 photos. **DWB**—Account of work, including use of radar equipped planes. *Subject Headings: 1. Icebergs 2. International Ice Patrol.—C.E.P.B.*

5A-202

551.501.7:551.507.321:551.557(26)

Great Britain. Naval Weather Service, **Computation of upper winds from balloon ascents at sea.** *Great Britain. Naval Weather Service, Memo*, No. 149/52, 1953. 4 p. fig. Minco. **GB-MO**—Describes computation of upper winds from visual or radar measurements from a moving ship. Plotted track method adds displacements of ship and balloon, using forms D6504 or 6501. For long ascents the relative velocity method, adding velocities, is preferred. The quickest is the semi-automatic A.R.L. Table method. *Subject Heading: 1. Upper air wind computation.—C.E.P.B.*

5A-203

551.509.1(26)

James, P. A. A., **The seaman assists the weatherman.** *Weather*, 8(1):13-15, Jan. 1953. **DWB**—Account of organization of voluntary radio reporting service of ships to Meteorological Office, London. *Subject Heading: 1. Ships weather messages.—C.E.P.B.*

5A-204

551.46:06

Lyman, John (*U. S. Navy, Hydrographic Office*), **Oceanographic activities of the Hydrographic Office, 1946-1952.** *American Geophysical Union, Transactions*, 34(1):122-124, Feb. 1953. 28 refs. **MH-BH**—Oceanographic and seismic surveys were performed mainly for the North Atlantic. Report on data collection and processing given. Over three million punched cards of surface ocean weather observations and 2,500,000 cards, representing surface currents, temperature, sea and swell from the Deutsche Seewarte deck, as well as 452,000 cards of Japanese oceanographic data were added to the collection. List of publications of the office given as well as list of papers written by the personnel of the office. *Subject Headings*: 1. Oceanographic research 2. Punched card collections 3. U. S. Navy. Hydrographic Office.—A.A.

5A-205

551.5(26):551.46

Neumann, Gerhard, **Ozean und Atmosphäre. Bemerkungen über einige meteorologisch wichtige Wechselbeziehungen.** [Ocean and atmosphere. Remarks on some meteorologically important interrelations.] *Naturwissenschaftliche Rundschau*, 6(10):405-411, Oct. 1953. 5 figs., 4 refs. **DWB**—Two points are amplified: 1) the dependence of oceanic circulation on general atmospheric circulation and their similarity, including convergence and divergence zones, and 2) the regulating effect of oceans on temperature. These are illustrated by examples, also showing effect of air-water temperature difference in N. Atlantic on precipitation, fog and storminess. The relation between non-periodic variations of atmospheric-hydrospheric circulation and temperature anomalies is examined. *Subject Headings*: 1. Marine meteorology 2. Ocean-atmosphere interaction.—C.E.P.B.

5A-206

551.509.21(26)

Research into the weather of southern oceans. *Marine Observer*, 23(160):84-88, April 1953. fig. **DWB**—Summary of work of British Naval Weather Service center at Simonstown in South Africa in organizing a system of ships' reports and preparation of weather charts. A typical chart is illustrated and some weather sequences described. *Subject Headings*: 1. Synoptic charts 2. South Atlantic 3. Indian Ocean.—C.E.P.B.

5A-207

551.46

Tully, John P., **Oceanography—science of the sea.** *Canadian Geographical Journal*, 47:148-165, Oct. 1953. illus., photos. **DLC**—An interesting popular introduction to oceanography, well-illustrated with simplified diagrams of the principal physical processes in the oceans and between ocean and atmosphere and with photographs of oceanographic instruments. *Subject Heading*: 1. Oceanography.

PERIODICALS

(Arranged alphabetically by title)

5A-208

551.5(06)

***Annalen der Hydrographie und Maritimen Meteorologie.** Hamburg, Deutsche Seewarte, v. 1, no. 1, 1873. Ceased publication with v. 72, No. 11, 1944. Subject and author index for 1921-1940 published separately, Hamburg, 1943. **DLC, DWB**—Monthly journal in German, v. 1-3 of which were entitled *Hydrographische Mitteilungen*. Important source of articles or data in meteorology, hydrography, climatology and oceanography. From 1935 to 1944, nearly three-quarters of the material was meteorological. Elaborate (often colored) fold-in charts and a large amount of detailed statistical and descriptive material, provide a first class source for oceanic areas or adjacent coasts and islands from the Arctic to the Antarctic, surpassed only by expeditions report which, however, generally suffer a 5 to 15 year delay in publication. Hundreds of short or medium length articles give accurate observations of unusual phenomena encountered by seamen or scientists on voyages as well as on expeditions. Included also are numerous articles on secular variations in climate of oceanic and continental areas and other studies obviously made by statisticians who utilized a large quantity of observational material. Publication of this journal lapsed in 1944 but it was succeeded by two new journals, *Annalen der Meteorologie*, published in the British Zone of Germany (Hamburg) and the *Deutsche Hydrographische Zeitschrift* (see 5A-217 below). (For fuller abstract, see item 2-6, Feb. 1950, MAB.) *Subject Headings*: 1. Periodicals 2. Marine meteorology 3. Hydrography 4. Oceanography 5. Germany. I. Hamburg. Deutsche Seewarte.—M.R.

5A-209

551.5(26)(05)

***Aus dem Archiv der Deutschen Seewarte.** Hamburg, Deutsche Seewarte, v. 1, 1878—v. 63, 1943-44. figs., tables, charts. **DLC**—The Norddeutsche Seewarte, established in 1868, was taken over in 1875 by the German Government as the Deutsche Seewarte for the purpose of investi-

gating navigation, instruments, oceanography and tides, meteorology and astronomy for the promotion of maritime commerce and industry. Each volume of "Aus dem Archiv" consists of approximately four to six monographs in German on meteorological and oceanographical subjects such as climate, expedition reports and wind driven currents. The series is amply illustrated with charts, maps, photos, tables, etc. *Subject Headings:* 1. Periodicals 2. Marine meteorology. **H. Hamburg. Deutsche Seewarte.**

5A-210

551(06)

***Beiträge zur Geophysik.** Leipzig, Becker & Erler, v. 1, 1887—v. 62, 1952 (latest rec'd). Editors: Dr. Georg Gerland, Stuttgart, and V. Conrad, Vienna. Corresponding editors: Abbott, Angström, Berlage, van Everdingen, Fleming, Gutenberg, Köppen, Linke, Störmer, Vegard, Weickmann, etc. Author and subject index, pub. 1933, covers v. 1-35. **DWB, DLC**—The volumes of this journal (popularly known as *Gerlands Beiträge*) comprise one of the leading sources of fundamental scientific articles on oceanography as well as all the other branches of geophysics. Reviews by leading scientists all over the world occupy a large portion of each issue and several pages of classified bibliographies appear in each volume. Most articles are in German, but there are many in English, French, Italian, Swedish, etc., with summaries in one or more languages. Contributors in addition to the editorial advisors listed above include V. and J. BJERKNES, DEFANT, HAURWITZ and scores of others. Articles are outstanding in their wealth of supporting data, charts, theoretical background and illustrative material. (For fuller abstract see 2-10, Feb. 1950, *MAB*.) *Subject Headings:* 1. Oceanography 2. Geophysics 3. Periodicals.

5A-211

551.5(26)(05)

*Berlin. Universität. Institut für Meereskunde, **Veröffentlichungen.** Old Series, No. 1-15, 1902-1913 (ceased publication). New Series: (A) **Geographisch-Naturwissenschaftliche Reihe**, No. 1-41, 1912-1944 (ceased publication). (B) **Historisch-Volkswirtschaftliche Reihe**, 13 Hefte. Also: **Meereskunde**, Sammlung Volkstümlicher Vorträge zum Verständnis der Nationalen Bedeutung von Meer und Seewesen, v. 1, 1907—v. 18, No. 206, 1932. Pub. of Berlin. Universität, Institut für Meereskunde. Superseded by **Das Meer in Volkstümlichen Darstellungen.** Berlin, E. S. Mittler, v. 1, 1933—v. 7, 1939. figs., tables, fold. charts. **DLC**—Four different series of monographs in German representing results of research by members of the German Institut für Meereskunde, of the Univ. of Berlin (established 1900) on all phases of physical and dynamic oceanography, including oceanic stratification, current dynamics, expedition reports and general circulation of the oceans. *Subject Headings:* 1. Periodicals 2. Oceanography

5A-212

551.46:06(05)

California. Univ. Scripps Institution of Oceanography, **Bulletin.** University of California Press, Berkeley, California, v. 1, 1927—v. 6, 1951-1952 (latest rec'd). V. 1-4 (8) have subtitle: Technical Series. **DLC**—The contributions to this series were, in the early years, largely marine biological in subject matter. Recently, however, there are more numerous papers dealing with physical and dynamic oceanography and meteorology written by staff members of Scripps and well-known outside contributors such as W. C. JACOBS and H. BYERS. *Subject Headings:* 1. Periodicals 2. Oceanography.

5A-213

551.5(26)(05)

*California. University. Scripps Institution of Oceanography, **Contributions, New Series.** No. 1-, 1937-. **DLC, DA**—Annual series of bound reprints of all contributions other than those papers published in the *Bulletin* of the Scripps Institution of Oceanography. Subject matter embraces all fields of oceanography with emphasis on marine biology. The long list of distinguished contributors includes H. U. SVERDRUP, G. F. McEWEN, R. H. FLEMING, C. E. ZOBELL and W. C. JACOBS. Incorporated in the series are the "Oceanographic observations of the 'E. W. Scripps' cruises of 1938-," compiled by H. U. SVERDRUP and staff, published by the University of California Press, Berkeley, 1942- and comprising the "Scripps Institution of Oceanography, Records of Observations." (Same item as 4I-99, Sept. 1953, *MAB*.) *Subject Headings:* 1. Oceanography 2. Oceanographic institutes 3. Periodicals. **I. Sverdrup, Harald Ulrik.**

5A-214

551.5(05)

Compania Administradora del Guano, Lima, Peru, **Boletin.** Vol. 1, 1925—v. 29(3), March 1953 (latest rec'd). **DLC**—The Compañía originated in Lima in 1909 as a semi-official corporation for the purpose of working in pure and applied science, agriculture, meteorology, zoology and oceanography in connection with the guano supply. Its small monthly publication contains a few articles on marine meteorology (e.g., variation of sea and air temperatures) and some climatic data for the coast of Peru. *Subject Headings:* 1. Periodicals 2. Climate of Peru 3. Guano industry.

5A-215

551.46:06(05)

*Conseil Permanent International pour l'Exploration de la Mer, Copenhagen, **Bulletin Hydrographique**. 1908-. maps, charts, tables. **DLC**—The Bulletin is a continuation of the *Bulletin Trimestriel des Résultats Acquis Pendant les Croisières Périodiques*, etc. (1902-1908) and incorporated the *Bulletin Planktonique* (1908-1912) of the same organization. Annual volumes in German and English or French and English contain extensive tables of temperature and salinity data at surface and selected depths, chemical composition data and current data chiefly from the Baltic and North Seas and North Atlantic. Data supplied largely by oceanographic research vessels of member nations. *Subject Headings*: 1. Periodicals 2. Oceanographic data 3. North Sea 4. Baltic Sea 5. North Atlantic.

5A-216

551.46:06(05)

†Conseil Permanent International pour l'Exploration de la Mer, Copenhagen, **Journal**. v. 1, 1926—v. 18 (3), 1953 (latest rec'd). figs., refs., tables. **DLC**—Each issue consists of general articles (chiefly on marine biology), reviews of outstanding oceanographical papers, and bibliography. Reviews generally appear in English or German with an occasional one in French or Spanish. Most valuable to meteorologists are the bibliographies containing references to marine meteorology, currents, salinity and temperature distribution, energy exchange and winds. *Subject Headings*: 1. Periodicals 2. Oceanographic bibliographies.

5A-217

551.46:06(05)

Deutsche Hydrographische Zeitschrift. Hamburg, Deutsches Hydrographisches Institut, v. 1, Jan. 1948—v. 5, 1952 (latest rec'd). figs., tables, fold. charts, refs., eqs. Vol 1, 1948 was issued with English title: *German Hydrographic Journal*. **DLC**—Published in six issues yearly it replaces the former *Annalen der Hydrographie und Maritimen Meteorologie* (see 5A-208 above). Subjects dealt with include coastal and open sea surveying, nautical science, navigation, chronometry, terrestrial magnetism, tides, and physical and chemical oceanography. Only the oceanographical aspects of marine meteorology and climatology receive attention, because other facets of those subjects are more fully treated by the Meteorological Office for Northwest Germany. Reviews of bibliographies included. *Subject Headings*: 1. Periodicals 2. Oceanography. I. Hamburg. Deutsches Hydrographisches Institut.

5A-218

550.3(05)

Geofysiske Publikasjoner. Oslo, Norske Videnskaps-Akademi, v. 1, 1920—v. 19(1), 1953 (latest rec'd). **DLC, DWB**—Volumes consist of from 5 to 17 monographs in German, English or French on meteorology, terrestrial magnetism, physical and dynamical oceanography and other subdivisions of geophysics. Included among the oceanographical studies are oceanographic surveys of the North Atlantic (v. 4, No. 2-4) expedition reports and tidal investigations. *Subject Headings*: 1. Periodicals 2. Geophysics 3. Oceanography 4. Meteorology. I. Norway. Geofysiske Kommission II. Norske Videnskaps-Akademi i Oslo.

5A-219

551.5(05)

*Indonesia. Djawatan Meteorologi dan Geofisik, **Verhandelingen**. No. 1, 1911—No. 42, 1952 (latest rec'd). figs., tables, fold. charts, refs. **DLC**—The *Verhandelingen* (a continuation of those of the Magnetisch en Meteorologisch Observatorium te Batavia, which was established in 1866 under the Netherlands East Indies government) are a series of monographs in German, Dutch or English reporting research accomplished in general meteorological (considerable upper air) and geophysical work and studies of sea water temperatures and other physical aspects of the sea by VAN BEMMELEN, BRAAK, VISSER, BOEREMA, BERLAGE and others. Most articles deal with the East Indies regions. *Subject Headings*: 1. Periodicals 2. Oceanography 3. Marine meteorology. I. Indonesia (K.) Magnetisch en Meteorologisch Observatorium te Djakarta.

5A-220

551.46:06(05)

Institut Océanographique, Monaco, **Bulletin**. Monaco, Musée Océanographique de l'Institut, v. 1, No. 1, Jan. 1904. Latest issue received v. 49(1002), 1952. v. 1-3, Nos. 1-87 entitled: *Bulletin du Musée Océanographique de Monaco*. **DLC**—The Musée was founded by Albert I, Prince of Monaco, in 1897 as an independent institution and began the publication of the *Bulletin* in 1904. In 1906 the Institut Océanographique was established, and the Musée was placed under its direction, the Institut continuing the publication of the *Bulletin*. Each volume consists of 20 to 30 short monographs in French with the exception of an occasional contribution in German or English. The subject matter is broad in scope, emphasizing marine biology but covering also many facets of physical oceanography. Numerous reports of the work of the research ship "La Princesse-Alice" are included. *Subject Headings*: 1. Periodicals 2. Oceanography.

5A-221

551.46(05)

†**International Hydrographic Review.** Monaco, International Hydrographic Bureau, v. 1, 1923—v. 30(1), May 1953 (latest rec'd). figs., tables, fold. charts, bibliogs. **DLC**—Published in French and English. Issued under title, *Hydrographic Review*, 1923-1946. One number only issued in 1923; in 1924 and thereafter there were two issues annually, May and Nov. except in 1926 when only one number appeared. Each volume consists of two numbers (200-300 p.) containing articles by authorities of many nations dealing with nearly every aspect of hydrography and many allied sciences. Contains bibliography of hydrographic publications. *Subject Headings:* 1. Periodicals 2. Hydrography 3. Oceanography. I. International Hydrographic Bureau, Monaco.

5A-222

551.46:06(05)

†**International Union of Geodesy and Geophysics. Association of Physical Oceanography. Publication Scientifique.** No. 1, 1931—No. 11, 1950 (latest rec'd). illus., maps (part fold). **DLC**—This series supersedes in part the Association's *Bulletin* (No. 1-17, 1921-31, Venice) which ceased publication in 1931. First two numbers were published in Helsingfors. All are chiefly in English and appear in monograph form on subjects in physical and chemical oceanography, marine biology and submarine geology. Considerable data and numerous bibliographies. *Subject Headings:* 1. Oceanography 2. Serial publications.

5A-223

551.46:06(05)

*Italy. Istituto Idrografico, **Annali Idrografici**, v. 1, 1900—v. 12(1-2), 1925-1928 (latest rec'd). **DLC**—Volumes covering from one to three years consist of brief notes on hydrography, navigation and meteorology, resums of the work of the Istituto Idrografico for the period in question and results of cruises of the Istituto Geofisico di Trieste. *Subject Headings:* 1. Periodicals 2. Oceanography.

5A-224

551.46(05)

***Journal of Marine Research.** Sears Foundation for Marine Research and Bingham Oceanographic Laboratory, Yale University, New Haven, Conn., Vol. 1, 1937—v. 12, 1953 (latest rec'd). **DLC**—This journal with its board of editors including Y. H. OLSEN, ISELIN, LEIPPER, MERRIMAN, PARR, MUNK, REVELLE, ROSSBY, SVERDRUP and THOMPSON is among the finest oceanographic series in the United States. Innumerable figures, charts, and tables illustrate the articles by leading authors in the field. Subject matter embraces marine biology, submarine geology, marine meteorology and physical and chemical oceanography. *Subject Headings:* 1. Periodicals 2. Marine meteorology 3. Oceanography. I. Sears Foundation for Marine Research. II. Bingham Oceanographic Laboratory.

5A-225

551.46(05)

***Journal of Oceanography.** Kobe, Japan, Marine Observatory, Vol. 1-13, 1929-1942. Ser. 2, v. 1(1), 1950—v. 2, 1951 (latest rec'd). figs., tables, fold. charts. **DLC**—Monthly publication in Japanese with English "Table of contents" and figure subheadings. Contains material of marine meteorological interest including reports of typhoons, ship weather observations, coastal observations of sea, swell, salinity and temperature and oceanographic observations in the Pacific. *Subject Headings:* 1. Periodicals 2. Oceanography. I. Kobe, Japan. Marine Observatory.

5A-226

551.46(05)

Kobe, Japan. Marine Observatory, **Memoirs**. v. 1, 1922—v. 10, 1952 (latest rec'd). tables, fold. charts. **DLC**—Quarterly journal in oceanography in English containing articles by Japanese authors on subject dealing with oceanography and marine meteorology. Considerable attention given to theoretical oceanography and typhoon studies. *Subject Headings:* 1. Periodicals 2. Oceanography.

5A-227

551.5(05)

Marine Observer. London, Meteorological Office. v. 1, 1924; latest issue received, v. 23(162), 1953. 340 p. per volume. illus. **DLC**—This quarterly journal of marine meteorology (published monthly 1924-1932, suspended Oct. 1939-July 1947) is a continuation of articles printed on backs of "Monthly Pilot and Meteorological Charts" (1901-1923) for the benefit of naval and merchant seamen interested in or cooperating with the Meteorological Service. Material comprises illustrated popular but original articles and short contributions in marine meteorology and oceanography. (Same item as 1-14, Jan. 1950, MAB.) *Subject Headings:* 1. Periodicals 2. Oceanography 3. Marine meteorology. I. Great Britain. Meteorological Office.—M.R.

5A-228

551.46(05)

Oceanographical Magazine. Tokyo, Central Meteorological Observatory, v. 1, March 1949—v. 4, No. 4, March 1953 (latest rec'd). Japanese title: *Ōbun Kayō Hōkoku*. charts, diagrs. **DLC**—Quarterly journal in English containing brief articles on the dynamics and thermodynamics of the oceans, energy exchange between sea and atmosphere, water mass analysis, theory of ocean currents, tidal analysis and annual reports of sea and weather observation on Antarctic whaling grounds. *Subject Headings:* 1. Periodicals 2. Oceanography 3. Marine meteorology. I. Japan. Central Meteorological Observatory, Tokyo.

5A-229

551.5:551.46(05)

Oceanography and Meteorology. Nagasaki, Japan, Marine Observatory, v. 1, No. 1, Feb. 1946—v. 6, No. 1, 1952/1953 (latest rec'd). figs., tables, refs. **MWB**—Four issues comprise each volume. Table of contents and an occasional abstract or article appear in English but otherwise the publication is completely in Japanese. Papers deal often with oceanographic instrumentation, water mass analysis, cold fronts and forecasting. *Subject Headings:* 1. Periodicals 2. Oceanography 3. Meteorology. I. Nagasaki, Japan. Marine Observatory.

5A-230

551.46(05)

†§**Papers in Physical Oceanography and Meteorology.** Cambridge, Mass., Massachusetts Institute of Technology and Woods Hole Oceanographic Institution. v. 1, 1930—v. 12(4), May 1953 (latest issue rec'd). maps, diagrs. **DLC**—Vol. 1, No. 1-4, appeared as M.I.T. Meteorological Papers, after which issue, the series title was changed to its present form. Each volume consists of four separate monographs on research carried out in the fields of meteorology, physical and chemical oceanography and marine biology. Among the numerous well known authors contributing are such men as H. U. Sverdrup, C.-G. Rossby, H. R. Seiwel, C. O'D. Iselin, H. B. Bigelow and J. Namias. A wealth of data and synoptic material is included as well as numerous bibliographies. *Subject Headings:* 1. Serial publications 2. Meteorology 3. Oceanography. I. Massachusetts Institute of Technology II. Woods Hole Oceanographic Institution.

5A-231

551.46(05)

Der Seewart: Nautische Zeitschrift für die deutsche Seeschifffahrt. Hamburg, Deutsches Hydrographisches Institut, and Hamburg, Seewetteramt, v. 1, 1932—v. 14(5), Oct. 1953 (latest rec'd). photos, diagrs., refs. **DWB**—A small illustrated journal containing brief popular articles on oceanography, marine meteorology and other subjects of interest to marine shippers. Simple charts and descriptions of selected harbors included. *Subject Headings:* 1. Periodicals 2. Marine meteorology 3. Oceanography. I. Hamburg. Seewetteramt II. Hamburg. Deutsches Hydrographisches Institut.

5A-232

551.5(26)(05) 551.311.1

*U. S. Coast Guard, **Bulletin.** No. 1, 1912—No. 37, 1952 (latest rec'd). tables, fold. charts. **DLC**—Bulletins contain annual reports of the International Ice Observation and Ice Patrol Service in the North Atlantic Ocean in its work of determining set and drift of icebergs and field ice, reporting presence by radio, rendering assistance to ships and making current, salinity, bathymetric and upper air observations. Comprehensive and detailed accounts of scientific observations with numerous charts (oceanographic, ice distribution, weather) and tables included. *Subject Headings:* 1. Periodicals 2. Sea ice 3. International Ice Patrol 4. North Atlantic.

5A-233

551.46:06(05)

Woods Hole Oceanographic Institution, **Collected Reprints.** 1933, pub. March 1934. Latest bound issue 1951, pub. July 1952. **DLC**—An extremely useful series. Each volume contains all "contributions from the Woods Hole Oceanographic Institution which appeared during the stated year in publications other than Papers in Physical Oceanography and Meteorology." The Annual Report of the Director is often included with the reprints for the year. The subject matter is broad in scope touching on almost all phases of oceanography. Outstanding among the long list of well-known authors are H. U. SVERDRUP, C. O'D. ISELIN, H. R. SEIWELL, A. C. REDFIELD, H. B. BIGELOW and P. E. CHURCH. *Subject Headings:* 1. Reprints 2. Oceanography.

5A-234

5(26)551.:06(05)

Woods Hole Oceanographic Institution, **Marine meteorology.** Contract N6-onr-277, Task Order II, NR-082-021. Technical reports, No. 1, 1949—No. 25, 1953 (latest rec'd). charts, diagrs., photos, tables. **DWB**—A series of monographs under separate authorship presenting the results of varied aspects of marine meteorological research accomplished at the Woods Hole Oceanographic Institution under the sponsorship of the ONR. *Subject Headings:* 1. Marine meteorology 2. Meteorological research. I. Contract N6-onr-277, Task Order II, NR-082-021.

BIBLIOGRAPHIES

(Arranged chronologically)

1890

5A-235

551.46:016

†Hamburg. Deutsche Seewarte, **Katalog der Bibliothek der Deutschen Seewarte**. [Catalogue of the library of the Deutsche Seewarte.] Hamburg, Hammerich and Lesser, 1890. 619 p. 10,600 refs. **DLC**—An alphabetical list within major subject subdivisions of the 10,660 works in the library of the Deutsche Seewarte at the end of 1889. Largest categories are meteorology (2769), physics (1617), magnetism and electricity (974), geology (607) and chemistry and technology (563). **Subject Heading: 1. Bibliographies.**

1920

5A-236

550.3(02)

† American Geophysical Union, **Transactions**. Published by the National Research Council of the National Academy of Sciences, Washington, D. C. v. 1, 1920—v. 34(4), Aug. 1953 (latest rec'd). **DWB, DLC**—Issues appearing every two months (after 1944) contain extensive geophysical bibliographies including one subdivision devoted to oceanography and comprising 20 to 30 unannotated recent references. **Subject Headings: 1. Bibliographies 2. Oceanography.**

1928

5A-237

551.46:016

†**Bibliographia Oceanographica**. [Oceanographic bibliography.] Italy, Consiglio Nazionale delle Ricerche, Comitato Nazionale per la Geologia, Geografia e Talassografia, v. 1, 1928—v. 20, 1947 (latest rec'd). Published 1929–1952. **DLC**—A fairly comprehensive, partially annotated (in Italian) bibliography of modern works on all phases of oceanography prepared under the direction of the Italian delegation of the International Commission for the Scientific Exploration of the Mediterranean. **Subject Headings: 1. Oceanographic bibliographies. I. Magrini, Johannes (founder) II. Brunino, Gustavo (ed.) III. Italy. Consiglio Nazionale delle Ricerche. Comitato Nazionale per la Geologia, Geografia e Talassografia.**

1937

5A-238

551.46:016

†Spiess, H. C., **Sechzig Jahre "Aus dem Archiv der Deutschen Seewarte."** [Sixty years of Aus dem Archiv der Deutschen Seewarte.] *Annalen der Hydrographie*, 65(10):467–479, Oct. 1937. 264 refs. **DLC**—In a chronological list of 264 contributions from the Deutsche Seewarte (1878–1937), 113 deal with meteorology, 42 with oceanography, 35 with astronomy and navigation, 22 with magnetism and 12 with instruments. Alphabetical author index follows list of works. No subject index. **Subject Headings: 1. Bibliographies. I. Aus dem Archiv der Deutschen Seewarte, Hamburg.**

1941

5A-239

551.46:016

†Grier, Mary Catharine (comp.), **Oceanography of the North Pacific Ocean, Bering Sea and Bering Strait: a contribution toward a bibliography**. Washington, University, Univ. of Washington Publications, Library Series, V. 2, 1941. 290 p. **DLC**—Extensive coverage of physical oceanography and marine biology of the region. References, a few briefly abstracted, include books, magazine articles and other documents in English and foreign languages. (Same item as 41–127, Sept. 1953, MAB.) **Subject Headings: 1. Oceanographic bibliographies 2. North Pacific 3. Bering Sea 4. Bering Strait.**

1946

5A-240

551.46:016

†Grier, Mary Catharine (comp.), **References on the physical oceanography of the western Pacific Ocean**. U. S. Hydrographic Office, Publication, No. 238, 1946. 74 p. 1227 refs. **DLC**—Second publication of bibliographic material compiled during World War II by Navy Hydrographic Office and reflecting the geographical limits of the war in the Pacific. Of 1227 references in many languages, about $\frac{1}{3}$ are briefly annotated. Reference made to recent editions of sailing directions, pilots, tide tables, and chart catalogs. Indexes of subjects, geographic names and expeditions included. (Same item as 41–174, Sept. 1953, MAB.) **Subject Headings: 1. Oceanographic bibliographies 2. West Pacific.**

1951

5A-241

551.46(99):016 55.15(99):016

†U. S. Bureau of Aeronautics (Navy), **Antarctic bibliography**. Prepared by the U. S. Naval Photographic Interpretation Center. U. S. Office of Naval Operations, NAVAER 10-35-591, Feb.

1, 1951. 147 p. all refs. 3 maps in separate pocket. **DWB**—Contains 365 references to the meteorology and climatology (p. 42–50) and 172 to the oceanography (p. 56–61) of the Antarctic. *Subject Headings*: 1. Antarctic bibliographies 2. Oceanographic bibliographies 3. Antarctic Ocean 4. Antarctica.

1952

5A-242

551.5:551.46:016

†U. S. Hydrographic Office, **Oceanographic and marine meteorological bibliography, Annali Idrografici, years 1900 thru 1923.** Washington, 1952. H.O. Misc. No. 15, 257–2. All refs. **DN-HO**—Unannotated, unindexed list of contents of the Italian journal, *Italy. Istituto Idrografico. Annali Idrografici* (see 5A-223), v. 1, 1900—v. 11, 1923—v. 12 (1–2) 1925–1928 arranged chronologically and then alphabetically by author within years. References presented in such form that they can be cut apart into index cards and arranged by their subject headings if desired. *Subject Heading*: 1. Oceanographic bibliographies.

1953

5A-243

016(98)

Arctic Institute of North America, **Arctic bibliography.** Prepared for and in cooperation with the Department of Defense, under the direction of the Arctic Institute of North America. [Edited by Marie Tremaine.] Wash., D. C., Govt. Print. Office, 1953. 3 v. continuously paged, 4478 p. **DLC**—The subject and geographic place index in vol. 3, p. 4064–4079, contains well over 800 references to various aspects of oceanography. Scope of the literature is worldwide but all titles are translated and all abstracts written in English. (For complete abstract, see item 4.11–1, Nov. 1953, *MAB*.) *Subject Headings*: 1. Arctic bibliographies 2. Oceanographic bibliographies 3. Climatology 4. Arctic. I. Tremaine, Marie (ed.) II. U. S. Dept. of Defense.

SUPPLEMENTARY MATERIAL

5A-244

551.46(05)

Akademiia Nauk, SSSR, Institut Okeanologii, **Trudy.** v. 1, 1946—v. 6, 1951 (latest rec'd). figs., refs., tables, illus. **DLC**—This Russian periodical for oceanography appears at irregular intervals. Each issue with 130–280 pages contains 7–20 articles, written mostly by members of the Oceanographic Institute in Leningrad. About 25% of the papers cover topics of interest to meteorologists, for example, propagation of thermal variations, dissipation of energy, horizontal and vertical Austausch, evaporation, heat balance, surface temperatures and their measurement, ocean currents and their dependence on wind, sea waves, etc. *Subject Headings*: 1. Oceanography 2. Marine meteorology 3. Periodicals.—A.A.

5A-245

551.5(26)(05)

Der Wetterlotse. Hamburg, Seewetteramt, No. 1, Jan. 1949—No. 58, June 1953 (latest rec'd). figs., tables, refs. **DWB**—A small monthly publication designed primarily for the use of ships' officers and therefore devoted largely to subjects of marine meteorological interest with emphasis on the Baltic and North Seas and the North Atlantic. *Subject Headings*: 1. Marine meteorology 2. Periodicals. I. Hamburg. Seewetteramt.

5A-246

551.506.5:91.04(99)

Giaver, John, Maudheim. **To År i Antarktis. Den norsk-british-svenske vitenskapelige ekspedisjon til Antarktis 1949–1952.** [Maudheim. Two years in the Antarctic. The Norwegian-British-Swedish Scientific Expedition to the Antarctic, 1949–1952.] Oslo, Gyldendal Norsk Forlag, 1952. 373 p. numerous photos, diagrs. Biographical sketches of members of the expedition, p. 368–373. **DLC**—The book is a descriptive commentary on daily life and scientific work at Maudheim. Brief attention afforded local weather. No data included. *Subject Headings*: 1. Maudheim Expedition, 1949–52 2. Antarctic expeditions 3. Antarctica.

5A-247

551.46:91.04

†Sewell, R. B. Seymour, **Oceanographic exploration 1851–1951.** *Science Progress*, London, 40(159):403–418, July 1952. 47 refs. **DLC**—A history of the various oceanographic expeditions and development of methods of research, and a brief survey of the present position. Ends with the foundation in 1949 of [British] National Institute of Oceanography. *Subject Headings*: 1. Oceanographic research 2. Oceanographic expeditions.—C.E.P.B.

- 5A-248** 551.46(05)
 †**Records of Oceanographic Works in Japan, New Series.** v. 1, No. 1, March 1953. Continuation of the *Records of Oceanographic Works in Japan*. v. 1, March 1928—v. 12, no. 2, March 1941. Compiled by the Special Committee on Marine Resources in the UNESCO Committee of the Science Council of Japan. (Pub. by Japanese National Commission for UNESCO.) 153 p. diagrs., tables, refs. In English. **DWB, MH-BH**—A journal devoted to promoting the development of marine resources by publication of worthy papers on pure and applied oceanography. No marine meteorology in the first issue. Subject matter deals chiefly with ocean currents and waves, temperature, salinity and chemical composition of sea water and marine biology. *Subject Headings:* 1. Oceanography 2. Periodicals. I. Ishibashi, Masayoshi (ed.) II. Japan. Science Council. UNESCO Committee III. Japanese National Commission for UNESCO.

- 5A-249** 551.5:06(26):92
 Schumacher, Arnold, **Matthew Fontaine Maury und die Brüsseler Konferenz 1853.** [Matthew Fontaine Maury and the Brussels Conference 1853.] *Deutsche Hydrographische Zeitschrift*, 6(2):87—92, 1953. 2 figs., 13 refs. **DWB**—An account of MAURY's life and pioneer work in marine meteorology, including organization of voluntary meteorological observations on ships and plotting of best sailing ship routes. The main events of his life are tabulated from his birth in Spottsylvania Co., Virginia in 1806 to his death at Lexington in 1873. *Subject Headings:* 1. Biography 2. Marine meteorology 3. Maritime Conference, Brussels, 1853 4. Maury, Matthew Fontaine.—C.E.P.B.

- 5A-250** 551.5(26):387
 *Bowditch, Nathaniel, **American practical navigator.** *U. S. Hydrographic Office, Pub.*, No. 9, 1843. 391+387 p. 137 figs., 43 tables, eqs., appends. **DLC**—One of the most comprehensive and complete coverages of all phases of navigation expressed in a clear, concise style with emphasis on practicality and usability. The first edition appeared in 1802 after which 9 more editions were published before the author's death in 1838. The work was so highly esteemed that the U. S. Hydrographic Office took over (1866) and perpetuates its publication and revision. A complete review of the 1938 (reprinted 1943) revision is under way at the H.O. with the new edition scheduled to appear in about 1955. Pt. I, devoted to text and appendixes, includes sections on ocean currents (p. 259), ocean waves (p. 266), winds (p. 268), cyclonic storms (p. 274) and ice movement in the North Atlantic (p. 298). Pt. II is composed entirely of navigational tables. *Subject Headings:* 1. Marine manuals 2. Marine meteorology 3. Marine navigation. I. U. S. Hydrographic Office.

- 5A-251** 551.46(02)
 Shokal'shiĭ, Iuliĭ Mikhaĭlovich, **Fizicheskaia okeanografiia.** [Physical oceanography.] Leningrad, 1933. 360 p. 162 figs., refs. **DLC**—The physical aspects of oceanography are treated here from the geographical point of view, avoiding lengthy theoretical discussions, but presenting comprehensive information, accumulated in the world literature up to that time on the distribution of land and water, water level variations, the bottom of the oceans, composition of sea water, distribution of temperature, sea ice, transparency, sound propagation, etc. Approximately half of the book deals with dynamic aspects as waves, tides and ocean currents, including wind effects. Numerous small scale maps show the geographic distribution of physical parameters and cross sections show their vertical characteristics. *Subject Headings:* 1. Physical oceanography 2. Ocean currents 3. Textbooks.—A.A.

PART III. METEOROLOGICAL ARTICLES APPEARING IN RECENTLY ISSUED PUBLICATIONS

Note: The contents of periodicals included in this section are for information only, and will not be listed in the monthly indexes until abstracted. When material is furnished in advance of date of publication, the pagination may be omitted.

American Geophysical Union, Transactions, Volume 34, Number 5, October 1953.

- Paulhus, J. L. H. and Gilman, C. S.: Evaluation of probable maximum precipitation, p. 701-708.
Saucier, Walter J.: Horizontal deformation in atmospheric motion, p. 709-719.
Burns, Joseph I.: Small-scale topographic effects on precipitation distribution in San Dimas Experimental forest. Discussion by Walter T. Wilson, p. 761-768.
Rhodes, Forrest L.: Report of the Committee on Snow, 1951-1952, p. 777-778.
Ackermann, William C.: Report of the Committee on Precipitation, 1952-1953, p. 778-779.

Meteorological Society of Japan, Journal, Volume 31, Number 4, April 1953.

- Sekihara, Kyo: On a relation between the distribution of ultraviolet sky radiation and the optical thickness of the atmosphere, p. 117-124.
Ogura, Yoshimitsu: Note on the theory of turbulent diffusion in the lower layer of the atmosphere, p. 125-131.
Arakawa, H.: Critical study on the angular-momentum-transfer method and vorticity-transfer method in the investigation of zonal circulation of the atmosphere, p. 132-138.
Kamamoto, Hiroo: D.C. self synchronous-motor used as wind direction meter, p. 139-155.

Number 5, May 1953.

- Yamashita, R.: On 'land and sea breezes,' p. 157-172.
Murakami, T.: On the seasonal variation of upper flow patterns. Part 1. From winter to spring, p. 173-193.

Number 6, June 1953.

- Arakawa, H.: On the maintenance of westerlies and tropical revolving wind systems, p. 195-205.
Ogura, Y. and Miyakoda, K.: Some remarks on the "Turbulent element model" of the isotropic turbulence, p. 206-218.
Ito, K.; Yano, T. and Hama, K.: Size distribution, crystal form and falling velocity of snowflake, p. 219-231.
Miyamoto, M. and Kojima, K.: The relation between the kinematic energy of typhoons and latitude of their generations, p. 232-235.

Number 7, July 1953.

- Ökita, T.: On the mechanism of dissipation of fog by model wood, p. 237-247.
Matsumoto, Seiichi; Hiroshi, Ito and Arakawa, Akio: On the monthly mean distribution of temperature, wind and relative humidity of the atmosphere over Japan from March 1951 to February 1952, p. 248-258.
Kobayashi, T. and Hori, J.: Application of Wiener's theory of prediction to the problem of long period weather forecasting (I), p. 259-267.

Number 8, August 1953.

- Ogura, Y.; Sekiguchi, Y. and Miyakoda, K.: Classification of turbulent diffusions in the atmosphere, p. 271-285.
Magono, C.: Volume distribution of the large precipitation elements, p. 286-297.

Meteorologische Rundschau, [Frankfurt], Volume 6, Number 7/8, July/August 1953.

- Kaiser, Heinz: Die Anwendung des Reynoldsschen Ähnlichkeitsgesetzes auf Strömungswiderstände und Ausbreitungsvorgänge in turbulenten Grenzschichten, [Application of

the Reynolds law of similarity to flow-resistance and diffusion processes at turbulent boundaries], p. 121-125.

Aichele, H.: *Lokalklimatische Froststudien am westlichen Bodensee*, [Local climatic frost studies on part of western Lake Constance], p. 126-130.

Franken, E.: *Statistik des ersten und letzten Auftretens von Frösten bestimmter Stärkestufen in Münster/Westfalen*, [Statistics of first and last occurrence of frosts of specified severity in Münster], p. 130-131.

Gressel, W.: *Eine für das Alpengebiet charakteristische Zirkulation*, [A circulation characteristic of the Alpine region], p. 131-133.

Doege, W. and Krebs, H.-D.: *Betrachtung zum Platzwetter in Neubiberg*, [Consideration of district weather in Neubiberg], p. 133-135.

Troeger, Heinz: *Die Beziehung zwischen der Änderung der Polhöhe und meteorologischen Elementen*, [The relation between changes of pole height and meteorological elements], p. 136-137.

Keil, Karl: *Der Anteil Deutschlands an der Entwicklung der internationalen Zusammenarbeit auf meteorologischem Gebiet*, [The part of Germany in the development of international cooperation in meteorology], p. 137-138.

Kreutz, W.: *Volumänderung der Bodenoberfläche in Abhängigkeit vom Wetter*, [Change of volume of the soil according to weather], p. 138-140.

Müller, Hans Gerhard: *Zur Wärmebilanz der Schneedecke*, [On the heat balance of the snow-cover], p. 140-143.

Faust, Heinrich: *Die mitteleuropäischen Grosswetterlagen bei Existenz eines Azorentiefs*, [The Central European general weather type during an Azores low], p. 143-145.

Friedrichs, H.: *Die Himmelsstrahlung als Funktion des Trübungsfaktors T und des Kurzstrahlungsfaktors T_K für einzelne Sonnenhöhenstufen*, [Sky radiation as a function of the turbidity factor T and of the short-wave radiation factor T_K for individual sun heights], p. 145.

eteoros, [Buenos Aires], Volume 3, Number 1, January/March 1953.

Díaz, Emilio L.: *El efecto dinámico de la Cordillera de Los Andes y el aislamiento de la acción perturbadora regional y superior*, [The dynamic effect of the Cordillera of the Andes and isolation of the regional and upper air perturbations], p. 7-30.

Dedebant, G.; di Maio, R. and Machado, E. A. M.: *Los números aleatorios y su aplicación a la meteorología*, [The variate numbers and its application to meteorology], p. 31-53.

Michajlikov, Vladimir and Juarez, Guillermo A.: *Tres años de experiencias de temple contra la sequía en trigo y en maíz*, [Three years' experience in the temper method against drought in wheat and corn], p. 54-80.

Ledesma, Néstor René: *Registro fitofenológico integral*, [Integral phytophenological registry], p. 81-96.

Pascale, Antonio Juan: *Comportamiento fotoperiódico de algunos trigos Argentinos*, [Photoperiodic behaviour of some Argentine wheat varieties], p. 97-112.

Revista de Geofísica, [Madrid], Volume 11, Number 44, October/December 1952.

Garmendia Iraundegui, J.: *Algunas aplicaciones de la teoría de torbellinos*, [Some applications of the turbulence theory], p. 328-332.

Garmendia Iraundegui, J.: *La teoría de torbellinos y los invariantes integrales*, [The theory of turbulence and the integral invariants], p. 333-337.

Lorente, José M.: *Frecuencia de la velocidades del viento: obtención aproximada de su curva*, [Frequency of wind velocity: the approximate construction of its curve], p. 339-348.

Weather, [London], Volume 8, Number 11, November 1953.

Johnson, D. H.: *The jet stream, Part II*, p. 325-329.

Riddell, L. H.: *Malham Tarn revisited*, p. 330-331.

Stark, R. G.: *November storms in Newfoundland*, p. 332.

Bonacina, L. C. W.: *An estimation of the Great London fog of 5-8 December, 1952*, p. 333-334.

Meetham, A. R.: *Localized pockets or one blanket?* p. 335-336.

Marwick, H.: *Weather words in the Orkney dialect*, p. 337-342.

Scorer, R. S.: *Pressure-fluctuation in mountain eddies*, p. 343-345.

Ashford, O. M.: *Unusual types*, p. 347-349.

World Meteorological Organization, WMO Bulletin, Volume 11, Number 4, October 1953.

Van Mieghem, J.: *International co-ordination of meteorological research*, p. 96-101.

Veranneman, N. L.: *Synoptic meteorology*, p. 101-107.

- First Session of Regional Association IV (North America), p. 108-109.
 Activities of the Technical Commissions, p. 110-111.
 Collaboration with other international organizations, p. 112-115.
 Technical assistance programme, p. 116-118.
 Fourth Session of Executive Committee, p. 118.
 Treussart, H.: French automatic weather station, p. 119-121.
 Gordon, A. H.: Dynamic climatology, p. 121-124.
 Membership of WMO, p. 124.
 New and notes, p. 125-127.
 Recent WMO publications, p. 128-129.

Zeitschrift für Meteorologie, [Berlin], Volume 7, Number 6, June 1953.

- Hinzpeter, Hans: **Zum Ausscheiden Professor Dr. Falckenbergs aus dem Meteorologischen und Hydrologischen Dienst**, [Resignation of Prof. Dr. Falckenberg from the Meteorological and Hydrological Service], p. 161-162.
 Falckenberg, G.: **Ein Beitrag zu dem Problem der Eigenstrahlung der freien Atmosphäre**, [A contribution to the problem of radiation of the atmosphere itself], p. 162-167.
 Skeib, Günter: **Ein rotierender Strahlungsumsatzmesser mit induktiver Übertragung der Messspannung**, [A rotational radiation balance meter with inductive transfer of test voltage], p. 167-171.
 Robitzsh, M.: **Tropfenadiabaten**, [Drop adiabats], p. 172-175.
 Heyer, E. and Grünewald, G.: **Der Nordseeorkan vom 31. Januar bis 1. Februar 1953 und seine Ursachen**, [The hurricane in the North Sea from Jan. 31 to Feb. 1, 1953 and its causes], p. 176-183.
 Voigts, Heinrich: **Gang der Jahresmitteltemperaturen im Sonnenfleckenzklus**, [The cycle of the annual mean temperatures in sunspot cycle], p. 183-188.
 Die **Witterung in der Deutschen Demokratischen Republik, April 1953**, [The weather in the German Democratic Republic, April 1953], p. 188.

LIST OF PERIODICALS

Note: This list contains the titles of the periodicals which regularly contain material on meteorology or related fields and it comprises only a small percentage of the periodicals from which pertinent articles are abstracted.

In this list the preferred form of title entry is given in bold face type. If the title is distinctive, the name and headquarters of the issuing society or organizations follows the title. If the title is not distinctive (for instance, Bulletin, Journal, Trudy, Mitteilungen), the entry consists of the issuing body followed by the title.

PERIODICALS IN WHICH METEOROLOGICAL ARTICLES REGULARLY APPEAR

- Académie des Sciences, Paris, **Comptes Rendus**.
- Akademiia Nauk, SSSR, Izvestiia, Ser. Geogr. and Ser. Geofiz., [Moscow].
- American Geophysical Union, Transactions, National Research Council, Washington.
- *American Meteorological Society, **Bulletin**, [Boston].
- *Angewandte Meteorologie, [Potsdam].
- *Annalen der Meteorologie, Seewetteramt, Hamburg.
- *Annales de Géophysique, Centre National de la Recherche Scientifique, [Paris].
- *Archiv für Meteorologie, Geophysik und Bioklimatologie, Ser. A and Ser. B, [Vienna].
- Australian Journal of Physics, [Melbourne].
- Ciel et Terre, Société Belge d'Astronomie, de Météorologie et de Physique du Globe, [Brussels].
- *Geofisica e Meteorologia, Società Italiana di Geofisica, [Genoa].
- Geofisica Pura e Applicata, Istituto Geofisica Italiano, [Milan].
- Geophysical Magazine, [Central Meteorological Observatory, Tokyo].
- *Időjárás, Az Országos Meteorológiai és Földmágnasségi Intézet [Budapest].
- *Indian Journal of Meteorology and Geophysics, [Delhi].
- *Journal of Atmospheric and Terrestrial Physics, [London].
- Journal of Geophysical Research, [Washington].
- Journal of Meteorological Research, [Tokyo].
- *Journal of Meteorology, American Meteorological Society, [Boston].
- *Journal Scientifique de la Météorologie, Société Météorologique de France, [Paris].
- *The Marine Observer, Air Ministry, Meteorological Office, London.
- *The Meteorological Magazine, Air Ministry, Meteorological Office, London.
- *Meteorological Society of Japan, **Journal**, Second Series, Kisho Shushi, [Tokyo].
- *La Météorologie, Société Météorologique de France, [Paris].
- *Meteorologische Rundschau, [Bad-Kissingen].
- *Meteoros, [Buenos Aires].
- *Monthly Weather Review, U. S. Weather Bureau, Washington, D. C.
- Nature, [London].
- *Nimbus, Sociedad Meteorológica de Bolivia, [La Paz].
- Polarforschung, Archiv für Polarforschung in Kiel, [Kiel, Germany].
- Revista de Geofísica, Instituto Nacional de Geofísica, [Madrid].
- *Revista Meteorologica, Junta Nacional de Meteorología, Montevideo.
- *Rivista di Meteorologia Aeronautica, Associazione Culturale Aeronautica, [Rome].
- *Royal Meteorological Society, **Quarterly Journal**, [London].
- Royal Society of London, **Proceedings**, Ser. B.
- *Tellus, Svenska Geofysiska Föreningen, Stockholm.
- Vsesoiuznoe Geograficheskoe Obshchestvo, SSSR, Izvestiia, [Moscow-Leningrad].
- *Weather, Royal Meteorological Society, [London].
- *Weatherwise, Amateur Weathermen of America, Philadelphia.
- *Wetter und Leben, Österreichische Gesellschaft für Meteorologie, [Vienna].
- *WMO Bulletin, World Meteorological Organization, [Geneva].
- *Zeitschrift für Meteorologie, Meteorologisches Observatorium, Potsdam.

* Indicates those periodicals which are primarily meteorological

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